

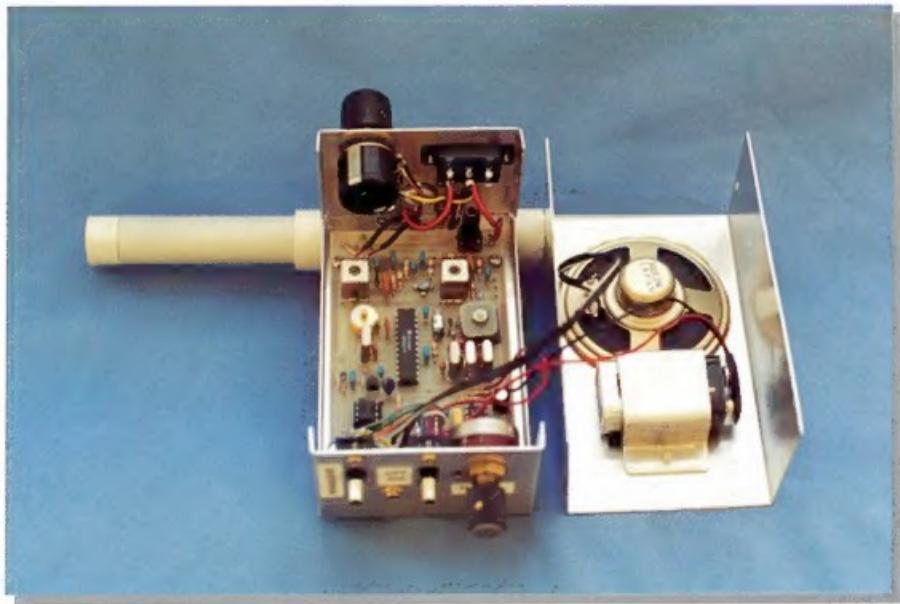
Amateur Radio

December 1997

Volume 65 No 12



Journal of the Wireless Institute of Australia



Full of the latest amateur radio news, information and technical articles including...

- Review of PV-35R & PV-85R 2 m Power Amplifiers
- Converting the PV-35R & PV-85R for SSB Operation
- An 80 m Receiver for ARDF

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CO - CQ (USA) Magazine review April 1996

Radio Comms - Radio Communications (UK)
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Radio & Communications - Radio & Communications (Aust)
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Cover

The VK3MZ 80 m ARDF receiver and directional antenna combination with the case open. Full details on how to construct this unit appear on page 12 of this issue of Amateur Radio magazine.

BACK ISSUES

Available direct from the WIA Federal Office, only until stocks are exhausted, at \$4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Plus, Minus, Left, Right

Over the last couple of months we have published comments about the polarity of the well-known two-pin T plug/socket as used widely for 12 volt mobile installations. As I commented last month, the standard suggested in an earlier item was reversed relative to an alleged emergency services standard. Now we find, as explained by two contributors elsewhere in this issue, that there are TWO STANDARDS, one in Victoria, one in New South Wales! Other States may have other ideas, but if T plugs are chosen there are only two possible ways to connect them, so, whichever you choose, you are right in one State and wrong in the other. This does sound like Australian politics generally, and the WIA in particular, doesn't it?

Having acquired a number of these plugs from my late brother-in-law, I decided the only way to be sure of correct polarity was to mark the positive with a dab of red nail varnish, both on the plugs and the sockets. I had acquired a little bottle of "Really Red" nail varnish some years ago, finding that it was excellent for re-colouring the port navigation light on my trailer-sailer. The original red fades in the sunlight in only a few months, yet the green starboard light has lasted for nearly 20 years! Why the difference, I wonder, for red to be so susceptible to ultra-violet, yet green unaffected?

Thinking of standards and navigation lights raises the point that red to port, green to starboard and keep to the right are universal rules for water and air traffic throughout the world. What a pity there is less agreement about road traffic, where the split is about 50-50. China, the Americas and Europe keep right, India, the UK, Japan and South-east Asia keep left. In Africa there are probably many border crossings where one is required to cross to the other side. This happened in Europe until Sweden switched from left to right some decades ago. It still happens when crossing the English Channel. Perhaps we should be glad that when we cross the River Murray it is only two-pin plug standards and similar details which change!

Christmas and New Year greetings to all.

Bill Rice VK3ABP

Editor

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk or via e-mail are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. A pamphlet, "How to Write for Amateur Radio", is available from VK3BR Communications Pty Ltd on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

ACA Proposes Limits on RF Radiation, Calls for Submissions

The Australian Communications Authority (ACA) has proposed introducing a regulatory framework to limit people's exposure to radio frequency electromagnetic energy.

The proposed regulations would apply to all operators and users of radiocommunications equipment, as well as equipment manufacturers and suppliers, and is designed to limit RF exposure for those who use or operate RF transmitters, as well as the general public.

Amateur radio stations and equipment used by amateurs, including home stations, handheld transceivers and mobile installations, will have to comply with the RF emission limit standards set down in the Australian Standard AS 2772.1, according to the ACA's proposal.

The WIA alerted members, and the amateur radio community, to this possible development in a *WIA News* item released in the first week of September. (See *WIA News, Amateur Radio*, page 3, October 1997).

A discussion paper outlining the details of the proposal was posted on the ACA's Internet Web site (www.aca.gov.au) in late October. The ACA are seeking comments by Friday, 19 December. The WIA's ACA Liaison Team is formulating a submission to respond to them.

The Australian Standard on non-ionising radiation, AS 2772.1, is at present a voluntary standard. The ACA propose making it a mandatory standard. The limits set out in the standard are based on the known heating effect on biological tissue exposed to RF energy. The RF energy levels outlined in the standard have a massive safety margin below the level required to raise the temperature of biological tissue by one degree Celsius.

The ACA's proposal responds to concerns over the possible connection between exposure to electromagnetic

energy and the development of cancers, even at levels of electromagnetic radiation (EMR) well below those required to cause a measurable rise in tissue temperature. While studies conducted around the world over decades have yet to show a causal link between exposure to either specific or general EMR, the scientific community is cautioning that no one can unequivocally say that RF energy, even at comparatively low powers, does not cause cancers.

Categories of Compliance

The ACA proposes two categories of compliance requirements to apply to equipment, with a separate two categories for operators and users. For low power devices deemed to "present a very low risk of exceeding the limits of the standard", self-declaration with a Declaration of Conformity document is proposed. For other radiocommunications equipment, the ACA proposes manufacturers and suppliers will have to provide a Declaration of Conformity based on test reports, in addition to "any other requirements that the ACA may deem necessary to confirm compliance."

The ACA is recommending that conditions would be imposed on the licences of all transmitters, which are licensed under the current Radiocommunications Act. Amateur radio licences would be included, according to the ACA's proposal, along with commercial and government broadcast transmitters, fixed and mobile radiocommunications systems, and telecommunications equipment, right through to mobile phones and CB radio equipment.

Under the current Radiocommunications Act, Class licences and Apparatus licences apply to transmitting equipment, except in the case of amateurs, where Apparatus licences are

issued to individuals who hold an appropriate Certificate of Proficiency. Spectrum licences would have conditions applied, too.

For devices and systems "whose installed performance is likely to be well within the AS 2772.1 limit", a three-tiered approach is proposed for evaluating compliance. Charts and graphs, approved by the ACA, which demonstrate performance within the exposure envelope defined by the standard is the first line of compliance conformity. The second tier is based on the use of mathematical formulas and computations related to accepted engineering standards and practices. Software computation may apply here. The third tier of compliance conformity is proposed to be based on performance evaluation from actual measurements. The latter would particularly apply to communications sites with many transmitters, according to the ACA discussion paper. This would affect beacon and repeater sites, and Division broadcast stations.

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In Australia, Standard AS 2772.2 specifies instrumentation and measurement techniques for potentially hazardous RF fields, in the near (within a wavelength) and far fields, across the 300 kHz to 100 GHz range.

A two-part article series on RF emission limits and amateur radio, written by Andrew Corney ZL2BBJ, a member of the joint Australian-NZ standards committee on non-ionising radiation, was published in the November and December 1995 issues of the NZART journal, *Break-In*. Requested in April 1996 to re-publish these topical articles in *Amateur Radio*, (the WIA has a reciprocal publishing agreement) the Publications Committee has, to date, declined any action.

A Global Thing

Human exposure to electromagnetic energy has become a global concern. In the USA, the Federal Communications Commission (FCC), in a controversial move, last year adopted RF exposure limits in regard to field strengths and power density for all transmitters operating between 300 kHz and 100 GHz. For a variety of circumstances, certain equipment meeting given specifications and operational parameters was 'deemed' to comply.

While not backed by federal legislation, the FCC's move was based on the recommended exposure limits adopted by the national Council on Radiation Protection and Measurement. More recently, for handheld, or other transmitters operated close to the body, the FCC adopted guidelines for safe limits in regard to the specific absorption rate (SAR) put out by the IEEE and ANSI.

US amateurs have to meet the FCC RF exposure limits from 1 January 1998, with the technical specifications based on American Institute of Electrical and Electronics Engineers (IEEE) standards. However, US amateur stations meeting given power output levels on specified bands, according to a sliding scale, are 'deemed' to comply. But those with higher powers will have to comply by changing station equipment and antenna specifications or locations, according to advice from the American Radio Relay League (ARRL).

In Europe, the European Telecommunications Standards Institute and the European Radiocommunications Organisation (ERO) have taken an interest in the issue of RF exposure. In Japan, earlier this year, the Ministry of Posts and Telecommunications (MPT) published guidelines for human exposure to electromagnetic fields. The MPT is looking at setting up regulations for systems where estimation or measurement is well established, such as broadcast transmitters, but will leave

mobile phones alone because they believe the procedure for estimating or measuring field strengths is unreliable.

Correction In the October issue, the WIA's representative on the Standards Committee on non-ionising, Dr Vince McKenna VK3AOY, was mistakenly described as a medical doctor. He's a physicist. Andrew Corney ZL2BBJ, also on the committee, was mistakenly given the title, 'Dr.' Apologies for that.
[Released 11/11/97]

WIA Papers for the Region 3 IARU Conference, Summarised

More than 100 individual papers were submitted to, and considered by, the International Amateur Radio Union Region 3 Association's 10th Conference, held in September in Beijing, China. The WIA submitted a total of 14 papers. Here are summaries of those papers. The authors were Dr David Wardlaw VK3ADW, Brenda Edmonds VK3KT and Roger Harrison VK2ZRH.

Report from the WIA

A summary of the affairs of the WIA and significant events affecting amateur radio in Australia since the 1994 R3 Conference. Topics covered included:

- Membership decline
- Institute structure (unique in the region!)
- Liaison with the SMA (now ACA)
- Radiocommunications Act changes
- RF Hazards
- Standards
- International Liaison
- ARDF
- High Honour Received by Australian Amateur (The 1995 Australia Prize shared by Dr Ken McCracken VK2CAX)
- Publications (AR and Call Book)
- Frequency Bands
- News and Information dissemination
- Beacons and Repeaters
- Contests and Awards
- Amateur Examinations
- IARU Monitoring Service
- Satellites

In addition, there were attached annexes on call sign suffixes, the Australian band plans, and UHF/Microwave Activity in VK. A number of topics covered in this report were

amplified in other WIA papers. (20 pages).

Harmonisation of Amateur Licence Qualifications

The official syllabuses of a number of countries in Region 3 are already similar and closely aligned with the European CEPT syllabus. There are reciprocal agreements between administrations of some Region 3 countries. The 1994 Region 3 Conference agreed harmonisation of licences in Region 3 was "a good thing". The WIA proposed a working group to investigate harmonisation of licences throughout Region 3. (2 pages).

The Conference accepted this. Brenda Edmonds was appointed convenor.

ICARE - International Council for Amateur Radio in Education.

The background to ICARE was outlined – a UK initiative which has since spread to countries in Europe, America and Africa. The object of ICARE is to encourage the introduction of amateur radio in school programs. ICARE is seen as a way to increase recruitment. The WIA proposed Region 3 become actively involved with ICARE and was willing to provide a co-ordinator. (2 pages).

The Conference left it up to individual societies.

Update on the WIA Exam Service

An information paper about progress with the WIA Exam Service since 1994 (updated the 1994 Region 3 Conference paper). No proposals. (1 page).

Further Development of the Stars* Project in Region 3**

Stars*** is the "Support of the Amateur Radio Service in IARU Region 3." The paper goes into the project's background, beginning at the 1991 Region 3 Conference in Bandung, Indonesia, as the "Promotion of Amateur Radio in Developing Countries" project. The WIA outlined eight points for consideration by the Conference and made five specific recommendations. (4 pages).

All points were discussed by a Conference working group and the recommendations on further action were adopted by the Conference.

Diminishing Recruitment to the Amateur Service

An information paper, providing figures on candidates sitting for amateur examinations in Australia in 1992, 1994 and 1996, noting a steady decline. The WIA proposed that the Region 3 Secretariat research and publish similar data from Region 3 member societies. (2 pages).

The proposed action was accepted by the Conference.

WICEN and Emergency Services

An information paper, outlining the role of WICEN, its structures, activities, responsibilities of co-ordinators, training, activations and its future. The paper highlighted WICEN's representation on the Australian Government's National Disaster Management Committee. (3 pages).

Submission to the Australian Government on Establishing a New Licensing System for Australian Radio Amateurs

An information paper giving the background to the licence fee battle of 1994-95 and the lead-up to the submission for a better system of licensing for radio amateurs in Australia. The executive summary of the WIA's submission was reproduced in full. (5 pages).

The Conference specially noted this paper, to bring it to the particular attention of every Region 3 member society.

The Amateur-Satellite Bands Contained in Footnote S5.282 to the ITU Radio Regulations

At present, the amateur satellite bands at 435 MHz, 1260 MHz, 2400 MHz and

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3400 MHz have a "less than secondary" status in the international frequency allocation tables. They are mentioned by footnote only, which means spectrum planners can miss them. The WIA proposed that the IARU (that is, the international organisation which represents the three regional organisations at ITU level) take steps to have the amateur-satellite bands included in the frequency allocation table in the ITU radio regulations. (3 pages).

The Conference endorsed this proposal. This issue will be important at WRC-99.

Electromagnetic Compatibility (EMC) Standards in Australia.

This paper covers the background to Australian legislation on EMC standards and its alignment with the European standards. A number of EMC problems affecting amateur radio in Australia were described. The issue of RF health hazards was specially covered – likely to be a concern for the radio amateur community across the world in future. The WIA recommended establishing a Region 3 EMC Co-ordinator. (6 pages).

The Conference adopted this proposal and the R3 Directors are to progress the matter.

Moves to Expand the 80 m DX Window Allocation in Australia.

An information paper giving the background to the present 3794-3800 kHz allocation and the WIA's submission to the SMA for an allocation of 3750-3900 kHz, to be time-shared with primary users, for amateurs to use the proposed allocation outside business hours. A map was provided, showing Australia's current and proposed allocations, along with allocations in other countries around the region. (5 pages).

Footnotes to the Frequency Table in the ITU International Radio Regulations

A feature of the international frequency allocation tables is the footnotes. These allow administrations to vary allocations. Some 17 footnotes affect amateur band allocations. The WIA proposed that the IARU (that is, the international organisation which represents the three regional organisations at ITU level) examine the existing footnotes and determine whether any

changes would enhance the amateur services. (6 pages).

The proposal was adopted by the Conference. This is an important point for the IARU's efforts at World Radio Conferences.

Developments In Radio-communications Licensing in Australia Since 1994 and the Impact on Amateur Radio

This information paper updated a paper on the subject submitted to the 1994 Region 3 Conference in Singapore. It outlines the recent changes to the Radiocommunications Act, the "commercialisation" of the radio frequency spectrum and changes to amateur licensing.

The recent history of beacon and repeater licensing in Australia, was described, along with the huge hike in fees and the successful WIA efforts to have more equitable fees applied. The paper outlined band pressures from new services in the UHF bands, including

Multipoint Microwave Distribution Services, Low Interference Potential Devices and Wireless Local Area Networks. The paper noted that these emerging services are appearing worldwide and that they will begin to encroach on amateur activities in every region, so the Australian experience is likely to have many parallels. (9 pages).

The paper was drawn to the attention of all Region 3 member societies.

Reaffirmation of Invitation to Hold the 11th IARU Region 3 Conference in Australia

This was a letter from the WIA's IARU Liaison Officer, David Wardlaw, to the Region 3 Secretary. The 9th Region 3 Conference in 1994 agreed that the 11th Conference would be held in Australia. The letter reaffirms the WIA's plans. (2 pages).

The Conference endorsed it. Australia will host the 11th Region 3 Conference in the Year 2000.

[Released 11/11/97]

1998 Call Book Out Now

The Wireless Institute's Call Book for 1998 was published on 31 October and was generally available through state Divisions from mid-November. Sales at hamfests in Victoria and Queensland in November were reported to be brisk.

Now titled "The Australian Radiocommunications Reference Guide and Radio Amateurs' Call Book," the 158-page book – larger than the 1997 edition – is selling for the same old price: \$14.95, or \$13 for WIA members. Post and packaging charges for mail order apply.

It will also be on sale through selected Dick Smith stores. Look for it – the cover's bright yellow!

Aside from the title change, there have been significant changes to the content and the layouts, in an effort to make the book more "reader friendly" and to appeal to a broader audience.

While the 1998 publication retains the broad division of reference material up front, followed by the call sign listings, this time the two sections have separate, identifying folio lines.

The reference section has been entirely "refreshed", with 15 items of entirely new material added, in addition to 14 items of popular and essential

material which have been completely updated.

New material includes:

- 6 m beacons world-wide,
- 10 m beacons and repeaters world-wide,
- NZ beacons,
- the five-band international HF beacon network,
- low frequency beacons, 200-400 kHz,
- how to attach coax plugs, correctly,
- how to get started in packet radio,
- packet wormholes explained,
- a full directory of packet radio systems,
- RS232 connections you need to know, and
- WIA World-Wide Web sites, and more.

The completely revised and updated material includes:

- the directory of nearly 500 Amateur Licence Examiners,
- the band-plans from MF (160 m) to SHF,
- Australian QSL Bureaux,
- Australian beacons and repeaters from HF to SHF,
- Australian VHF-UHF records,
- WIA broadcasts, and
- operation of amateur stations in Australia, from the ACA.

Only three items have been repeated: Australian and NZ TV channel frequencies, and the WIA affiliated clubs directory.

The WIA decided to revitalise the publication in preparation for the introduction of the call sign listings in digital form – anticipated next year – so this annual publication will have to have a new role.

This year, the call sign listings have been reproduced, unedited, from the Australian Communications Authority's public register of licensees. All the details are there, warts and all – 16,540 of them in the 100-page section.

They are listed in straight alphanumeric order, in line with international practice, rather than the 2-letter/3-letter suffix order, ranked alphabetically, as in the past. For better readability of the necessarily small typeface, the listings have been typeset in upper and lower case.

There are no suppressions of licensee details in the 1998 Call Book. The ACA has an obligation under the 1992 Radiocommunications Act to maintain a public register of all radiocommunications licensees, to which they plan to provide access by various means. For example, on their Internet web site. Because of this, and because the Call Book is no longer published under contract from the Australian Government Publishing Service (which required offering suppressions), the WIA is no longer involved in maintaining suppressions in the Call Book.

In the 58-page Reference Guide section, 90 Australian beacon frequencies are listed, 236 packet radio system frequencies, and 403 repeater system frequency pairs.

There are 210 2 m voice repeaters around Australia, and a further 110 on 70 cm.

For 6 m enthusiasts, 150 beacons around the world outside Australia are listed, along with 170 10 m beacons across the globe.

If you're interested in the low frequencies, below the AM broadcast band, 300 LF beacons between 200 kHz and 406 kHz, located around Australia and New Zealand, are listed along with their locations.

For packet radio enthusiasts – beginners and old hands alike – there's

plenty of reference material. Beginners are given a guide on where to start. For those already using packet, the technology and applications of packet wormholes are explained. The five-page Australian Packet Radio Directory lists 236 system frequencies.

If you've recently had your interest sparked in Amateur Radio Direction Finding – ARDF – the radio sport taking off in Asia, Europe and North America –

the ham radio activity for which you don't need an amateur licence – there's an illustrated explanation and details of who you contact to get involved.

The 1998 Australian Radiocommunications Reference Guide and Radio Amateurs' Call Book appeals to many interests. The print run is limited. Don't miss out. Order your copy now.

{Released 3/1/97, updated 11/1/97}

Another NSW Recruit Scores a Fluke!

New recruit to the WIA NSW Division for September, Mr B Haro VK2SJN of Croydon Park in Sydney, has scored the Fluke 12B digital multimeter. He's the fourth recruit from VK2 to win a Fluke DMM.

There's a multimeter been won every month throughout 1997 in a draw from among new WIA recruits joining in any particular month. December is your last chance to join the WIA and go in the monthly draw to win a Fluke 12B digital multimeter worth \$195.

The 12 prizes for the year have been generously donated by Philips Test & Measurement. Fluke is the world's pre-eminent manufacturer of digital test instruments and the Model 12B is from their latest range of hand-held instruments. The Fluke 12B measures AC and DC voltage (with auto-selection

above 4.5 V), resistance and capacitance from 1000 pF to 1000 µF. The instrument features a simple rotary dial, a 4000-count liquid crystal display, and diode and continuity testing. Its "continuity capture" feature indicates intermittent open and short circuits. It comes with test leads and a two-year warranty.

Every newcomer to electronics and amateur radio needs a good multimeter, and every seasoned enthusiast could always do with another one. And the chances of winning are very good!

Membership recruitment advertisements have appeared in each issue of *Amateur Radio* magazine, and in *Radio and Communications* magazine throughout 1997. Membership recruitment and renewal advertisements also appear on WIA Divisions' World Wide Web pages on the Internet.

Model Commemorative Sputnik On The Air!

The model Sputnik built as a cooperative effort between French and Russian school children was launched from the MIR spacecraft on 3 October and can be heard regularly close to 145.820 MHz as it orbits the Earth about every 94 to 97 minutes.

During the week immediately after being thrown from an airlock aboard MIR, its orbit remained very close to that of the Russian spacecraft. The 2 m beacon aboard the model Sputnik emulates the "beep-beep" of the original satellite. It can be heard on SSB or FM receivers, with only a simple dipole or ground plane antenna. It's even been logged on a handheld rig with a "rubber ducky" antenna.

The pitch of the Sputnik beacon's modulation varies according to the

satellite's internal temperature. At 50 degrees C, it's at 1361 Hz, at zero degrees, it's 1131 Hz, and at -40 degrees, it's 541 Hz, reports the *ARRL Letter* for November.

The satellite was built and launched to commemorate the 40th anniversary of the launching of the first artificial earth satellite in October 1957.

Secondary school students from French Reunion Island and Nalchik in Russia built the 1:3 scale model. Reception reports can be sent to the club station at College Reydellet, FR5KJ, 103 rue de la Republique, 97489 Saint Denis Cedex, Reunion Island, or to Sergei Sambourov, PO Box 73, Kaliningrad-10 City, Moscow Area, 14070, Russia. You are asked to include a SASE and one IRC for a certificate.

■ Equipment Review

PV-35R and PV-85R 2 m Power Amplifiers

Reviewed by Chas Gnaccarani VK3BRZ*

Introduction

As most users of 2-metre hand-held or portable rigs know, there are times when their comparatively low power of two to three watts just won't cut the mustard. Like when you're operating from the car, for example, and your signal into a repeater is scratchy. Or perhaps you find that your packet hook-up just isn't reliable with such low power. What you wouldn't give for a little more muscle!

This pair of 2-metre "brick" power amplifiers from Dick Smith Electronics is specifically targeted at such situations. First introduced in the 1996/97 catalogue, the PV-35R 30 watt amplifier

replaces a similar unit from the previous catalogue, whilst the PV-85R 80 watt amplifier is an entirely new offering. Priced at \$129.95 and \$199 respectively (the PV-85R is on special at \$169 at present), they are an absolute steal. You couldn't even buy the parts to build them for that money.

Description

Both amplifiers include an integral GaAsFET receive pre-amplifier which can be switched in as required, and are specified for 3 W nominal drive power (0.5 to 5 W according to the instruction sheets). They are intended for 13.8 V DC operation, the current requirements

being specified as 6 A for the 30 watt unit and a hefty 20 A for the 80 watt unit.

Both amplifiers are 125 mm wide and 45 mm high, the 30 watt unit being 147 mm long, and the 80 watt unit 208 mm long, including all protrusions. Simple LED front-panel metering is provided on both units for relative RF output and, quaintly, DC supply voltage.

Whilst both amplifiers are labelled on the front panel as "linear amplifiers", thus implying they are suitable for both FM and SSB, the catalogue descriptions make it plain that they are intended solely for FM operation. This is backed up by the instruction sheets as well as the label on the packaging box. Be warned: as they come, these amplifiers are not suitable for SSB operation!

This is for two reasons. Firstly, and more importantly, the transistors are operated in Class-C, that is without bias current. Secondly, the transmit/receive switching is actuated by the driving RF signal. Whilst this is fine for FM, there is no provision for selecting a delayed-release for SSB use.

This is a great pity. No doubt there will



be some FM operators who will want to add that extra grunt to their signal, but my experience is that it is the SSB users who are generally more serious about their station capability, and who would have purchased these amplifiers had they been suitable. For the sake of a couple of dollars' worth of components, an entire market sector is lost, especially in the case of the 80 W unit.

A glance at its circuit board revealed that it was designed as a proper linear amplifier, but the important biasing components have been left out, and part of the circuit board has been deliberately punched out, seemingly to prevent subsequent modification! Beats me!

The amplifiers are fitted with the usual SO-239 RF sockets, and you have to supply the appropriate patch-lead to go between your rig and the amplifier's input socket. You also need a 13.8 V power supply capable of delivering the current required by either amplifier if you intend using one in the shack.

How the Bricks Stack Up

Not owning a 2 m hand-held transceiver, I chose to test these amplifiers with my Yaesu FT-290R MkI multi-mode rig. It produces 3 W output, just as required. I suspect that many other owners of this model rig, and its successor, would be very interested in these amplifiers, but heed the warning about SSB.

Whilst the output power tests were pretty straightforward to perform, as was the pre-amp gain measurement, substantiating the manufacturer's claim of a 1.8 dB noise figure was not, as I do not have access to a noise figure meter. Instead, I elected to measure the 12 dB SINAD sensitivity of the transceiver with, and without, the pre-amp activated. As it happens, this will probably be more meaningful to FM operators.

Tests were carried out at both ends of the two metre band, and there were no significant differences in the results. The results are summarised below. The figures in brackets relate to the PV-85R, while those without brackets relate to the PV-35R.

Drive Output	DC Supply	
Power	Power	Current
0.5 W	18 W (65 W)	4.3 A (14.5 A)
3 W	33 W (90 W)	5.5 A (17.5 A)

Pre-amp Gain 11 dB (10.2 dB)

Pre-amp Sensitivity 0.14 μ V (0.14 μ V) for 12 dB SINAD*

(*FT-290R sensitivity without pre-amp was 0.22 μ V for 12 dB SINAD)

Comments

Both units met their published specifications, apart from the pre-amplifier gain, which was within a dB or so of the claimed 12 dB. Frankly, this is of no concern, as the improvement in sensitivity provided by the pre-amp was very noticeable, and it is the sensitivity, rather than the outright gain, which counts. In fact, it is better to utilise the minimum gain in order to minimise front-end overload problems.

It is worth elaborating on the sensitivity of the pre-amp. My FT-290R's sensitivity is pretty average as far as 2 m rigs go. Most 2 m hand-holds would be noticeably more sensitive. If you look at the test results, you will see that the 12 dB SINAD figure came down from 0.22 μ V to 0.14 μ V, which represents an improvement of almost 4 dB. To put this in perspective, the same improvement in signal-to-noise ratio would require more than double the power at the transmitter, or replacing a $\lambda/4$ wave whip with an extended Ringo or similar antenna. Not bad, for just a push of a button!

However, the pre-amp requires rather circumspect use in RF-hostile environments, as the additional gain might send most hand-held radios into front-end overload, especially from 148 MHz pagers. The instruction sheet warns of this possibility and, in all probability, the majority of modern hand-holds already have adequate sensitivity.

One other matter worth mentioning is the heat-sinking of the amplifiers. I didn't undertake specific tests for this, merely noting the temperature rise by touch during testing and in a few QSOs. The 30 watt unit never became more than just very warm, whereas the 80 watt unit eventually became so hot that you would not want to hold it for more than a few seconds. While its heat-sink is considerably larger than its lower-powered cousin, it should be noted that, at full output, it has to dissipate almost 160 watts of heat, compared to just 50 watts for the smaller unit. Adequate

ventilation is mandatory, especially in mobile installations. Short overs might help too!

Do You Need One?

My perception is that many owners of hand-held radios probably also own a mobile FM rig of perhaps 25 or 50 watts output. They use their hand-holds for the purpose they were intended – handy, pocket-sized, battery-operated portable rigs. If that describes your situation, you probably don't *need* one of these amplifiers (but at the price, you might want one anyway!).

However, if your hand-held rig has to do service in the shack and the car as well, then the extra punch delivered by these amplifiers will give you a commanding signal. And there's something wicked about picking up a pocket-sized rig, and crunching out 80 watts!

Thanks to Dick Smith Electronics for supplying the amplifiers for the review.

*66 Simeon Close, Lara VIC 3212



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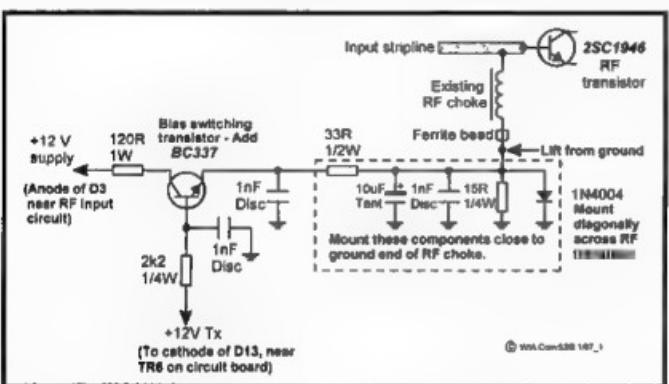
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■ Transmitting

Converting the PV-35R and PV-85R 2 m Power Amplifiers for SSB Operation

Chas Gnaccarini VK3BRZ* describes how experienced amateurs can convert these bargain amplifiers for SSB operation.



Schematic of the bias modifications to the PV-35R amplifier for use on SSB.

Can They Be Used For SSB?

In ascertaining whether these 2 m FM power amplifiers are suitable for SSB operation, there are three important questions to be answered:

- Are the amplifier stages biased for linear operation?
- What is the maximum drive power which can be applied without driving the amplifier into distortion?
- How is the transmit/receive switching accomplished?

I'll address each question in order.

Biassing

For FM operation, there is no requirement for the amplifiers to be biased into conduction. However, an SSB signal must have its modulation envelope preserved, without distortion. Without appropriate bias current,

"crossover" distortion will result, manifesting itself as "splatter".

Unfortunately, these amplifiers are not biased, so on this count they are *not* suitable for SSB. It is possible for an experienced constructor to modify them and add the necessary biasing circuitry. However, some "surgery" is required, particularly in the case of the 80 watt unit, which has not one, but two stages to be modified.

Circuits of the modifications are shown in the accompanying diagrams. I respectfully suggest that, if you need more detailed information than is provided, you probably shouldn't attempt the job. You should also appreciate that the warranty will most likely be voided by the modifications.

Drive Power

The question of maximum driving

power is rather less well defined. The output power available from any "linear" power amplifier (which includes audio amplifiers as well as RF amplifiers) depends on how much distortion you (or someone else!) are prepared to tolerate. With linear RF power amplifiers, this distortion takes the form of "splatter" into adjacent channels, which is intolerable to other band users.

So, it is vitally important to set the drive power correctly. For example, if you refer to the test results for these amplifiers, you will see that the PV-85R produced 65 W with only half a watt of drive. If it were truly linear, then one watt of drive should produce 130 W output, but you can see that, even with three watts drive, the amplifier delivered only 90 W. This is because the amplifier reaches saturation at around one watt of drive. From that point, any more drive does not result in more output.

This is of no concern for FM use, but it would result in severe distortion (again, splatter) if an SSB signal were being amplified. For SSB use, the drive power should be adjusted to a point well below saturation. I suggest that the PV-35R be driven to no more than 30 W output and the PV-85R to no more than 80 W when used for SSB.

After modification to add the biasing circuitry, the power gain of both amplifiers increases noticeably. The drive required by the PV-35R will only be about 500 mW, and the PV-85R, being a two-stage amplifier, will require no more than 200 mW to produce full output.

For use with the FT-290R transceivers, an easy way to set the drive properly is to select the low power mode and adjust its level accordingly. Refer to the rig's manual for the adjustment pot location. Be sure to remember to always select low power for SSB use, otherwise you will produce a horrendously wide signal!

Alternatively, a resistive attenuator can be placed at the base of the power transistor (not at the input socket, otherwise you attenuate the received signals too). Place a DC blocking capacitor (1000 pF disc ceramic) after the attenuator otherwise it will affect the bias. Refer to the ARRL Handbook for attenuator resistor values. The PV-35R will need about 6-7 dB of attenuation, and the PV-85R around 10-12 dB.

Transmit/Receive Switching

Finally, we come to the matter of transmit/receive switching. Modern practice with VHF power amplifiers is to include circuitry to detect the presence of the RF driving signal and use it to switch the power amplifier into the transmit mode. This is simply for convenience, as few rigs have any connection for switching a PA these days.

This is precisely how it's done in these two amplifiers, and for FM use, where the RF drive is always present during transmission, it works fine.

SSB is another matter though. The driving waveform's amplitude is continually varying according to the speech and, during pauses between words, there is no RF present at all. This would cause the changeover relays to "chatter" as you speak. Amplifiers intended for SSB operation usually have a switch which allows you to select a delayed release, thus holding the relays in for a second or so, just enough until the next syllable. These two amplifiers are *not* equipped with this feature.

The PV-85R has provisions on the circuit board for an electrolytic capacitor to add the necessary time constant for this purpose, and it is a simple matter to add the delayed release feature. This is not the case with the PV-35R, but one can be soldered in as shown in the accompanying diagrams. If you feel confident that you understand the purpose of the modifications, and have some experience working on modern equipment, you may wish to attempt them. Be aware, though, that such

modifications generally void manufacturer's warranties. Also, you are responsible for any disasters you might precipitate!

Modifying the Units

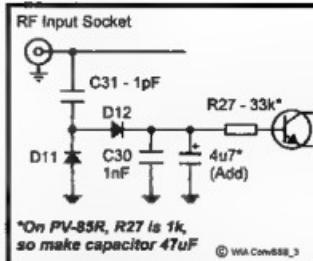
Both amplifiers were modified for SSB use, and the accompanying circuits show how this was done. The circuit board of the PV-35R is clearly marked with the component identities, so the appropriate connection points should be easily to locate.

However, this is not the case with the PV-85R, making it difficult to explain the locations of the appropriate connection points. The best bet is to locate them with a multimeter.

The additional components can be soldered in "dead bug" style. The only really critical construction is the bypassing of the ground-end of the base chokes, which should be done right at the choke, keeping the capacitor leads short. All wiring should be kept well clear of the strip-lines, to avoid the possibility of RF feedback. The diode should be mounted diagonally across the transistor case, with the body of the diode in thermal contact with the transistor's ceramic cap. Apply a little thermal-transfer compound between them.

The quiescent current for the PV-35R should be 50 to 80 mA. For the PV-85R, the driver stage should be biased to about 50 to 80 mA, and the final to about 100 to 150 mA.

Modify each stage one at a time, and measure the quiescent current, adjusting the value of the bias resistor if necessary. The bias current can easily be measured.



*On PV-85R, R27 is 1k, so make capacitor 47uF

© WA CowSSB_3

Schematic of the delayed VOX release modifications to both the PV-35R and PV-85R amplifiers for use on SSB.

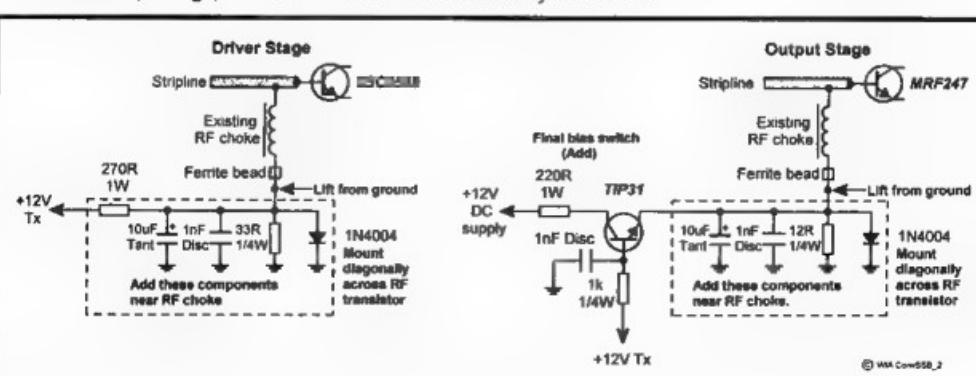
Simply connect a milli-ammeter in series with the power supply, switch the amplifier into transmit mode (do not apply any drive!) and measure the total current. Momentarily short the base of the transistor to ground, and note the reduction in total current. This is the bias current of that transistor. It's a good idea to leave a dummy load connected during this test in the unlikely event that the amplifier goes into oscillation.

After successfully adding the biasing circuits, connect a rig and dummy load to the amplifier, and tweak the input trimmer of the amplifier for maximum output. Finally, re-assemble the amplifier case, and the job is finished.

Many thanks to David VK3XLD, who assisted in developing the modifications and performing the tests, and to Dick Smith Electronics for allowing us to experiment with the amplifiers.

*66 Smeaton Close, Lara VIC 3212

HIF



Schematic of the bias modification to the two amplifier stages in the PV-85R amplifier for use on SSB.

■ Receivers

80 m Receiver for ARDF

Ian Stirling VK3MZ* describes a receiver and directional antenna combination that is suitable for direction finding on the 80 m band.



The VK3MZ 80 m ARDF receiver.

The receiver is a single conversion SSB receiver and the antenna is of the ferrite rod or "loop-stick" style.

The Melbourne fox-hunting group are very active in vehicle based hidden transmitter events. We are now expanding this interest into pedestrian style events (our partners and families would probably describe it as an obsession rather than an interest!) The pedestrian style fox-hunting is known as ARDF (Amateur Radio Direction Finding) and is very popular throughout the world, particularly in Japan, Korea, China and Germany.

Many of the Melbourne fox-hunting fraternity have been competing in our monthly vehicle-based fox-hunts for

fifteen or more years and feel like a new challenge. The sudden interest in ARDF was precipitated by an ARDF competition held in Townsville last year. Australia was the host nation for an international ARDF event that spanned five days and attracted competitors from many countries. A group of VK3s went to Townsville and had a fabulous time. The VK3 participants have spread the word south about what a great activity ARDF is. We have since held several ARDF style events which were well attended with up to 14 competitors taking part.

At the conclusion of the Townsville competition the VK4s offered a loan of a set of transmitting gear to the VK3s. This generous offer was quickly accepted by Mark Diggins VK3JMD. Four excellent transmitters built by Ron Graham VK4BRG were transported down to Melbourne and they have helped us get this exciting radio sporting activity off the ground in VK3.

ARDF is conducted under a strict set of international rules. The rules describe the type of transmissions, course length and protocol for competitors. The amateur bands used for ARDF are 2 m and 80 m. The 2 m band is very well established as a fox-hunting band in VK3, however, we are not very experienced at 80 m fox-hunting.

The aim of this article is to stimulate and facilitate the construction of 80 m sniffers and increase the number of people able to participate in 80 m ARDF style events.

The performance of this sniffer with the loop-stick antenna in the uni-directional mode is not unlike that of a two metre sniffer with a three element beam. However, when the antenna is switched to the bi-directional mode, very accurate DFs can be taken and this makes 80 m a very attractive band for direction finding.

How It Works

The ferrite rod "loop-stick" antenna is switchable from a "figure of eight" pattern (bi-directional) to a cardioid pattern (uni-directional). The loop-stick and vertical sense antenna combination is based on a design in the ARRL handbook. Minor changes have been made to allow easy reproduction with locally available parts.

The receiver has one stage of RF amplification at 3.5 MHz. The signal is then converted up to an intermediate frequency of 8.00 MHz; this takes place within the MC3362. Although intended for FM applications, the Motorola MC3362 IC makes a very effective SSB receiver chip. Only the two mixers, two oscillators and varactor diodes are put to use in this receiver. The IF is selected by a simple crystal filter on the first mixer output. This is followed by a product detector which gives an audio output.

The RF amplifier associated with Q1 provides a gain of approximately 20 dB. The control voltage on gate 2 of Q1 allows this stage to also function as a signal attenuator, which is important when DFing up close to the transmitter.

The 3.5 MHz output from the RF amplifier goes to the first active mixer in the MC3362 and combines with the 4.5 MHz VFO Potentiometer RV1 tunes the 4.5 MHz VFO by varying the bias on a pair of varactor diodes within the 3362 IC. The specified VFO tank circuit produces a tuning range of about 100 kHz and I used a ten-turn pot to allow easy tuning of sideband signals. A buffered VFO output is available from the 3362 and this is used in the tune-up procedure.

The 8.00 MHz IF component of the

BON RECEIVER FOR ORDF (UK3NZ)

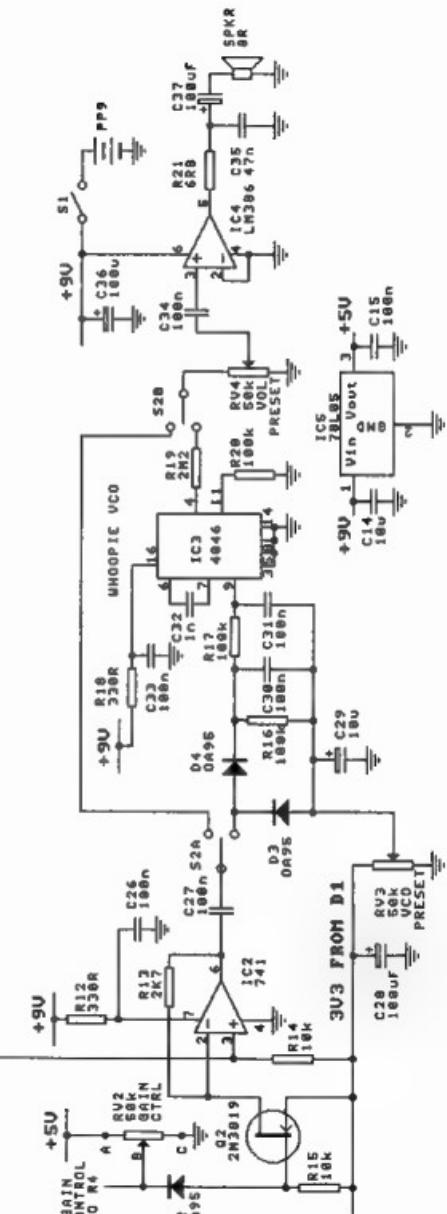
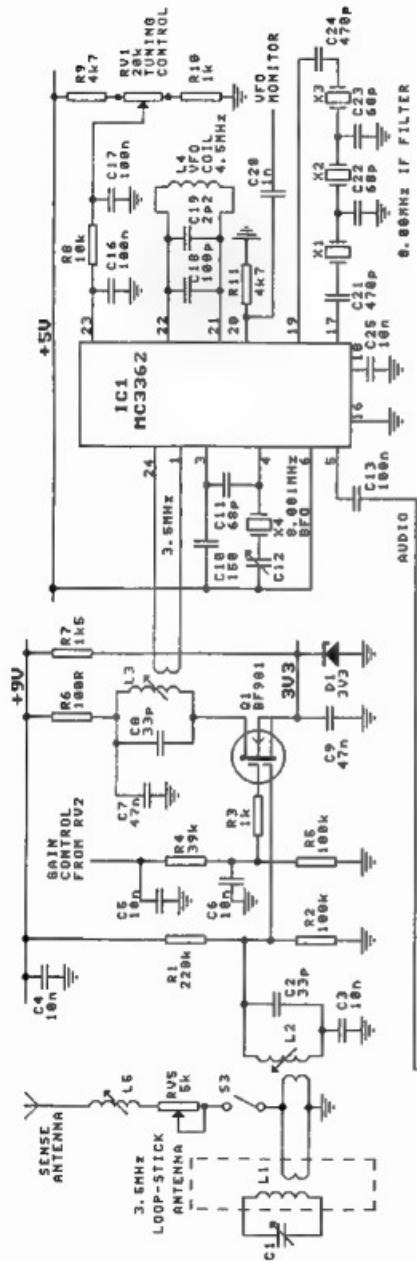


Fig 1 - Schematic of the 80 m ARDF receiver.

first mixer output is selected by the simple ladder crystal network of X1-X3. Capacitors C21 to C24 set the filter bandwidth to approximately 4 kHz when typical computer crystals are used. A fairly wide IF bandwidth has been chosen to facilitate tuning while on the run.

The 8.00 MHz IF signal passes directly to the second mixer in the MC3362 which works as a product detector and gives an audio output. There is no IF amplification. The RF amplification of Q1 and the gain of the active mixers in the 3362 provide more than adequate gain for the 80 m band. X4 sets the BFO frequency which, in this application, is tuned to the high side of the IF pass-band to allow reception of LSB signals.

The stage associated with IC2 is a gain variable audio amplifier. The gain is adjustable from about 0 to 20 dB. The RF gain of Q1 and the audio gain of IC2 are both controlled by RV2. The audio from IC2 may pass directly to the LM386 audio PA, or it can be switched to the "whoopie" VCO.

Diodes D3, D4, and the following RC network, produce a DC signal on pin 9 of IC3 which is proportional to received signal strength. The VCO in IC3 is set to operate in the audio range and produces a "whooping" sound as the antenna is pointed towards or away from the signal being tracked.

The "whoopie" mode is now widely used in ARDF and generally allows a bearing on transmitter location to be more easily discerned than by judging received audio loudness. An "S meter" could be used, however the operator would need to stop and read the meter, whereas an ear piece, together with "whoopie" mode, can be used while on the run.

Receiver Specifications

Single 9 V battery, current drain 50 mA. Sensitivity better than 0.2 μ V. Single conversion 8 MHz IF. Bandwidth 4 kHz approx. Tuning range 100 kHz approx. Receive modes of LSB and "whoopie" signal strength.

Construction Notes

The circuit board is single sided, and board population and soldering is straight forward. The loop-stick antenna

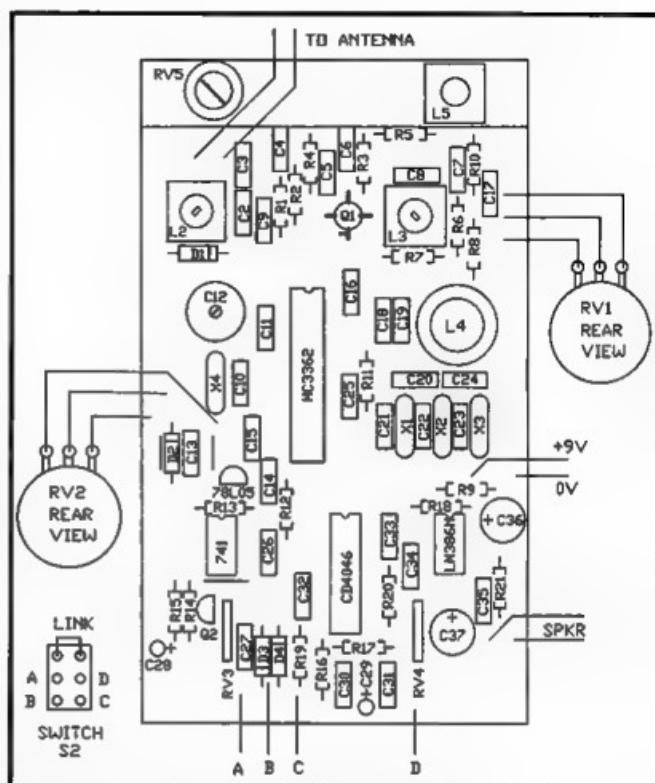


Fig 2 - Circuit board layout of the 80 m ARDF receiver.

is made by winding 20 turns over the centre of a 10 mm diameter, 200 mm long ferrite rod. The loop-stick is housed in an electrical tee-junction box which has short lengths of conduit protruding from each end.

The antenna tuning capacitor C1 is located in the junction box cavity. The junction box is mounted directly on to the back of the metal housing box, as near as possible to the part of the box which will become the "top".

The sense antenna is a straight piece of brazing rod soldered into a PL-259 plug. An SO-239 socket is mounted on top of the metal box to provide secure but removable connection. The cardioid pattern is achieved by switching the sense antenna "in" and then adjusting RV5 and L5 for a single null. Mount RV5 on the underside of the PCB. Drill holes

on the metal box to align with RV5 and L5. This will facilitate easy adjustment of the vertical signal to achieve the cardioid pattern.

Receiver Tune Up

Set RV1 to the mid-position and connect a frequency counter to the VFO monitoring point on the PCB. Note that the VFO frequency is 8.00 MHz minus the desired 80m frequency (eg to tune 3.850 MHz the VFO must run at 4.150 MHz). Experiment with the values of C18 and C19 until the desired VFO frequency is achieved. For good VFO stability use only silver mica, polystyrene or NPO capacitors for the selected values of C18 and C19.

The tuning range can be reduced by increasing the value of R9. To increase the tuning range, increase the number of turns on L4 and decrease C18. The value

of the 10-turn potentiometer is not critical; any value between 10 k and 100 k will be fine. A single turn pot may be used if only a small segment of the 80 m band is required. R9 must be increased accordingly.

Use a signal generator or a strong local signal to tune L2 and L3 for maximum received signal strength. Adjust RV2 for a comfortable listening volume. Switch to "whoopie" mode and adjust RV3 so that the "whoopie" signal is a fairly low frequency purr in the absence of a received signal. When a strong signal is received, the "whoopie" tone should rise in pitch considerably.

Antenna Tune Up

This should be done during the day to avoid sky wave effects. Run a low power signal of about 10 W and locate the receiver 0.5 to 1.0 km from the transmitter. Set the system to bi-directional mode by disconnecting the sense antenna with SW3. Peak the loop-stick antenna by adjusting C1 for maximum received signal. Set RV5 and L5 to their mid-positions. Connect the vertical antenna with SW3. One of the peaks will now be larger than the other. Orientate the unit so that it is on the weaker peak. Adjustment of RV5 will now reduce this peak even further. Now adjust L5 (the effect of adjusting L5 and RV5 is to create a single null opposite a single broad peak). RV5 and L5 interact and some back and forth adjustment will be required to achieve a single null with the correct orientation.

If the null is off the front of the unit instead of the back, the position of the null may be moved 180 degrees by simply reversing the link connection from the antenna to the receiver input. For further description of the antenna set-up procedure refer to the ARRL Handbook. Look up "Direction Finding" in the index.

Component Supplies

Drilled circuit boards, pre-wound TOKO coils for L2, L3 and some of the other hard to get components are available from the author. Write to Ian Stirling VK3MZ, 169 Glenvale Rd, Ringwood North, VIC 3134. Phone 03 9876 3643
E-mail I.Stirling@bhtafe.edu.au

Parts List

Metal Box 130 x 75 x 55 mm (Dick Smith Electronics Cat H-2325). Sense antenna, 360 mm of 2 mm diameter brazing rod, trimmed during adjustment procedure.

L1 - 20 turns of 0.7 mm wire wound on ferrite aerial rod 200 mm long, 10 mm dia (DSE Cat R-5105). Spacing of one wire diameter between turns wound over centre of ferrite rod. One and a half coupling turns. Tuned to resonance by C1 shunted with a fixed 27 pF capacitor.
L2, L3 - pre-wound TOKO coils, available from author.

L4 - 55 turns of 0.2 wire on AMIDON toroid T-50-49 (red mix) (Truscott's Electronic World). Secured to PCB with 3 mm nylon screw and nut with 14 x 14 mm bare PCB with a 3 mm hole used as top securing plate.
L5 - double layer of 0.2 mm wire, close wound over 12 mm of Neosid 4.8 mm former (DSE Cat R-5020). F16 slug (DSE Cat R-5025).

RV1 - 20 k 10 turn pot (or single turn pot, see text).

RV2 - 50 k linear pot.

RV3 - carbon trim-pot 50 k horizontal adjust.

RV4 - carbon trim-pot 50 k horizontal adjust.

RV5 - 5 k cermet, vertical adjust.

D1 - 3V3 Zener, 400 mW

D2, D3, D4 - OA95 etc.

Q1 - BF981 etc.

Q2 - 2N3819

IC1 - MC3362

IC2 - 741

IC3 - 4046

IC4 - LM386

IC5 - 78L05

X1, X2, X3, X4 - 8.000 MHz computer crystals.

S1, S3 - single pole double throw switch.

S2 - double pole, double throw switch.

Resistors are all 0.25 W.

R1 - 220 k

R2 - 100 k

R3 - 1 k

R4 - 39 k

R5 - 100 k

R6 - 100 R

R7 - 1k5

R8 - 10 k

R9 - 4k7

R10 - 1 k

R11 - 4k7

R12 - 330 R

R13 - 2k7

R14 - 10 k

R15 - 10 k

R16 - 100 k

R17 - 100 k

R18 - 330 R

R19 - 2M2

R20 - 100 k

R21 - 6R8

Capacitors are disk ceramic or monoblock unless otherwise specified.

C1 - 5-55 p Philips

C2 - 33 p

C3 - 10 n

C4 - 10 n

C5 - 10 n

C6 - 10 n

C7 - 47 n

C8 - 33 p

C9 - 47 n

C10 - 150 p

C11 - 68 p

C12 - 5-55 p Philips

C13 - 100 n

C14 - 10 μ tantalum

C15 - 100 n

C16 - 100 n

C17 - 100 n

C18 - 100 μ polystyrene or SM

C19 - 2p2 NPO

C20 - 1 n

C21 - 470 p

C22 - 68 p

C23 - 68 p

C24 - 470 p

C25 - 10 n

C26 - 100 n

C27 - 100 n

C28 - 100 μ electro 16 V

C29 - 10 μ electro 16 V

C30 - 100 n

C31 - 100 n

C32 - 1 n

C33 - 100 n

C34 - 100 n

C35 - 47 n

C36 - 100 μ electro 16 V

C37 - 100 μ electro 16 V

*169 Glenvale Road, Ringwood North VIC 3134

ar

**Tell the advertiser
you saw it in the
WIA Amateur Radio
magazine!**

ALARA

Sally Grattidge VK4SHE*, ALARA Publicity Officer



ALARA YLs at the CLARA Gala. (l to r) Elizabeth VE7YL, Lois WB3EFQ, Aola ZL1ALE, Gwen VK3DYL, Raija SMOHNV, Barbara KA3VXR, Ruth IT9ESZ, and Margaret VE3BNN.

Christmas greetings from all the YLs of ALARA to YLs and OM's all over the world.

CLARA Gala

This report was typed by Gwen VK3DYL at the QTH of Elizabeth VE7YL straight after breakfast! Gwen had arrived in Vancouver the night before, very late as the plane was delayed by snow storms in Calgary. She had been up north looking for polar bears in Churchill, and was very happy to have seen ten (looking forward to more details later, Gwen).

The Canadian YL Association (CLARA) held its 30th Birthday celebrations in Toronto over the last weekend in September. 47 YLs from eight different countries laughed and joked their way through the three days, and the hotel will probably never be the same again. In attendance were also a few OM's and a guide dog-in-training.

"ALARA was well represented by: Gwen VK3DYL, Elizabeth VE7YL, Lois WB3EFQ, Aola ZL1ALE, Raija SMOHNV, Barbara KA3VXR, Ruth IT9ESZ and Margaret VE3BNN."

"It was great to catch up with old friends (sorry, friends of long-standing!) and to meet other YLs who, in the past, had just been voices on the air or e-mail communicators.

Lots of new friends were made and many an e-mail address exchanged; I don't think I'll have time for any housework when I get home, but it was well worth it.

"And yes, Dave ZL1AMN behaved himself very well!"

Dol VK2DDB received that message from Gwen by e-mail and took the trouble to pass it on, even though she was busy producing her first Neighbourhood Watch news-sheet at the time.

Cough Up!

ALARA membership is due on 1 January, so don't put your November Newsletter in the drawer before removing the attached membership form, filling it in and sending it (with money) to the treasurer, Margaret Schwerin VK4AOE, PO Box 758, Dalby, QLD 4405. New members, or anyone who has already lost their form, please contact Margaret.

Around and About

Margaret ZL3UD now lives on a 12.5 acre farm and has started an Alpaca stud.

Janis VE7AAP and OM Garry VE7ACM are cat lovers (funny how the world is divided into lovers and haters when it comes to cats) and have started an album of Radio Cats. As of September 1994, Janis had over 150 cats

from all over the world, all well presented and documented, but she would love to have more. If you have a Radio Cat and would like it represented in her collection, send her a photograph and some information, eg cat's name, your name and callsign, and any other interesting details. Margaret ZL3UD sponsors Janis and is collecting cats for her, so send to her at Nellavale Downs, Downs Rd, Hororata, RD2 Darfield 8172, NZ.

Joan Harris has finally obtained her licence and is operating on her OM's old callsign of VK5ZRH. Congratulations Joan, well done Jean VK5TSK and Tina VK5TMC are still struggling with the dreaded Morse. Work commitments and fading enthusiasm make it hard going. Don't give up girls. Both plan to have full calls by the next ALARAMEet.

Korea Ladies Amateur Radio Club

(from IARU Region 3 Magazine)
Chae Do Sook HL1KDW

Since the 1950 Korean war the position of women in that country has gradually started to change. More women are being educated at university and are pursuing careers. As with working women all over the world, life is busy with little time for recreation, but many are joining the ranks of amateur radio operators and enjoying the rewards of friendship and communication between women from all walks of life.

Chae Do Sook has been an amateur for 10 years after being trained in the Korean Amateur Radio League to obtain a licence in 1988. She has made friends all over the world and loves to collect QSL cards.

The KLARC (Korean Ladies Amateur Radio Club) was formed in June 1984 with only 150 YLs total in Korea and 20 active YL operating members. There are now over 20,000 amateurs in Korea alone, ten percent of which are YLs.

KLARC has a YL field day once a year where information is exchanged and instruction given to beginners (some fun and friendship too, I am sure - VK4SHE). A YL journal, KLARC NEWS, is published, but is not a regular event at this time. On-air etiquette of courtesy and politeness is considered very important.

Svalbard Polar YL QSL

If you want to be in this experience of a lifetime, you must register before 31 December. Write c/o Ruth Tollefson, PO Box 17, Tveita, N-0617, Oslo, Norway. E-mail jetcpro@sn.no. Phone +47-2226 9330; or fax +47-2226 9712.

*C/o PO Woodstock, QLD 4816

Tel 077 788 642

Packet: VK4SHE@VK4RAT#NQ QLD AUS OC

Internet e-mail: rgrand@ozemail.com.au

AMSAT Australia

Bill Magnusson VK3JT*

National co-ordinator

Graham Ratcliff VK5AGR
E-mail: vk5agr@amsat.org

AMSAT Australia net:

Control station VK5AGR

Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Keplerian Elements

Current keps are available from the Internet by accessing the AMSAT FTP site, [ftp.amsat.org](ftp://amsat.org) and following the sub-directories to "KEPS".

the Ariane 5 series. However, in August, ESA removed Phase 3D from the payload when it became clear that the required structural modifications to its space-frame would not be finished in time for the AR-502 launch.

The need for modifications came about as a result of ESA's discovery that launch loads on the AR-502 flight might be significantly higher than they had first anticipated. The structural modifications meant that many components already fitted to Phase 3D had to be removed and subsequently re-installed. The spacecraft is now nearing completion to the new specifications. An early rescheduling of the launch is anticipated now that the Ariane program has resumed.

Amateur Satellite Image Downloading and Processing

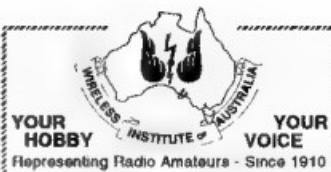
Graham VK5AGR is running a series in the *AMSAT-VK Newsletter* on this fascinating topic. The first part dealt with the image processing software developed by Colin VK5HI. It runs under Windows 95 and has heaps of goodies for satellite imaging enthusiasts. Colin has succeeded in turning a previously complex task into a very simple one by some clever programming. He has gained quite a reputation for this kind of software with several previous generations already in widespread use throughout the amateur radio satellite community.

Graham explained in detail how to configure the WiSP ground station software to automatically capture the image files and then went on to describe the versatile image processing functions of Colin's *CCD Display 97* program as well as his small DOS based program, *DISP_ACT.EXE* which can be used to preview the large image files after partial downloading. This is a great time saver as the image files are quite large and this program allows a "sneak preview" early in the download so that uninteresting or corrupted files can be terminated without waiting for a complete download.

MIR Update

There's no doubt that the American presence on MIR has sparked a huge increase in the popularity of the packet PMS and other MAREX operations. So much so that the PMS mailbox is often full these days. This has prompted several occasions when the system has had to be closed down. The crew are very busy. They have a full schedule of duties without having to worry about whether the PMS is full.

Amateur radio is a **RECREATIONAL** activity for them and lately the opportunity



Representing Radio Amateurs - Since 1910

**RECRUIT
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This latest hand-held DMM, from the world-leading maker of digital test instruments, has advanced features yet is simple to use. Ideal for tyro & veteran.

The Fluke 12B measures:

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- diode and continuity testing
- indicates intermittent opens & shorts
- 2-year warranty

Fluke 12B prizes generously donated by Philips Test & Measurement.

Each month's prize is awarded by way of a draw among newly recruited members each successive month and presented to the winner at the earliest opportunity following the draw.

To sign up a new member, use the back of your AR magazine address leaflet - or clip the coupon, have them fill it out and send it now.

SEND TO YOUR DIVISION'S ADDRESS, SHOWN ON PAGE 56

X-----

Please send me a membership application

NAME

ADDRESS

P/Code

Call Sign (if any) [AR 12/97]

for spending the hours required to read and answer all the greetings and other messages just hasn't been there. It doesn't seem all that long ago that one could look forward to having a leisurely chat with the Cosmonauts and even doing the occasional digipeat to a friend through the MIR packet station. Looks like those days are gone forever.

Perhaps when the ISS is up and running we can look forward once again to chatting to the, hopefully, more relaxed occupants during their scheduled recreation time and working through and via a more capacious digital system.

Planning for the decommissioning of MIR is already underway. One would expect that the packing up and return of the amateur radio gear is somewhere on the list over the next year or three. It will be interesting to see how long it survives. Perhaps its proven record as a backup communications system will extend its life a little longer than would otherwise be the case. At the time of writing the SAFEX 70 cm repeater is still turned off. It is not known when this experiment will be turned back on.

Sputnik-1 Replica Produces Good Signal

I wonder how many people around the world have tuned in to the signal from the 40th anniversary 1/3 scale replica of Sputnik-1. Some pundits are calling it RS-17 but I have not seen any official announcement to that effect.

The most enduring memory I will have is just how strongly the signal came in. It seemed impossible that a 100-200 mW transmitter in orbit could produce such a loud signal. It bounced the "S" meter of my old Kenwood TR-7400-A FM transceiver against the stop for the entire pass on the first occasion I heard it. It conjured up memories of that day in October 1957 when I received the signal from Sputnik-1.

My friend Neil Town VK3AMK was a staff photographer with the Melbourne Herald/Sun in those days. His time exposure picture of the Sputnik-1 rocket streaking across the Melbourne night sky was produced full front page next day. The space race had begun. It grabbed the public imagination as new, spectacular announcements were made by NASA and the Russians almost daily. Few of us would have thought that only four years later we would see the first amateur radio OSCAR in orbit. Neil is still active on 80 metres and we often reminisce about those days and that event in particular.

As I was listening to the signal from the scale model Sputnik replica booming in, I turned up the volume and went outside. Sure enough, there was MIR going over, just

visible in the evening glow. The tiny Sputnik had not been released long enough to separate very far from MIR where it was "hand-launched" by Cosmonaut Pavel Vinogradov during a space-walk a day earlier. The signal was on 145.820 MHz this time, but, as I listened, I reached over to my old Eddystone S-680-X receiver and gave it a pat on the head and turned the dial to 20 MHz as I did that day 40 years earlier.

I had recorded the signal from Sputnik on a Byer 66 reel-to-reel tape recorder (the Rolls Royce of recorders in its day) coupled to the line output of that receiver. The Byer "bit the dust" long ago and has been replaced by a more modern Marantz machine and the

tape has been dubbed onto a cassette which I was able to use to compare the signals. All in all a wonderful experience. Enough to bring a tear to the eye!

Thanks are due to all those involved in the project, both in France and Russia. As well as stirring our souls, their efforts and initiative have given many schools around the world the opportunity to do some very good science work. Perhaps somewhere there is a student listening to and recording the signal today who will be a scientist on board the International Space Station or beyond in another 40 years time.

*RMB 1627 Milawa VIC 3678
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ARDF – Amateur Radio Direction Finding

Ron Graham VK4BRG*

JOTA and ARDF

This is being written as plans are being made for the forthcoming JOTA. Here in Sarina we have had some ARDF activities with JOTA over the last three years and it has involved Scouts, Cubs, Guides and Brownies. I think JOTA presents a marvellous opportunity to promote ARDF activities, and thus amateur radio in general, with the Scouting and Guide movements. As well as being a great outdoor Scouting type activity, ARDF can nicely supplement the normal JOTA programmes. So, now might be the time to start planning for JOTA 1998.

Naturally, there are many ways of organising the ARDF side of JOTA. This could possibly be done by a different group of amateurs than those that do the more normal communications side of JOTA; those with a specific interest in ARDF. This would help split the workload and mean that groups of Scouts can simultaneously be involved with the regular JOTA activities plus ARDF. Equipment needed would be a low power fox plus a few sets of "sniffer" type receivers. One could even get by with just one receiver, simply demonstrate the concept of ARDF, then let individuals have some "hands on" experience. Two metres will probably be the chosen band. I hope to make some comparisons between 2 metre and 80 metre ARDF in a future column, but it appears that 80 metre equipment would be less costly.

Further to the ARDF and JOTA relationship (plus some general comments), Wally VK4DO has contributed the following thoughts: "There are several matters that require some thought and attention.

(a) For Clubs that participate in JOTA in a camp or field location, it would be an idea to introduce ARDF foxhunting/radio sport well in advance of JOTA.

(b) Because 80 metres is far simpler to get going and a lot less costly, this is the band to start on. The ferrite rod is far superior to a beam for getting exact directions and easier to explain to beginners.

(c) By making ARDF a Club project, it could be introduced to the Scouts/Guides several months ahead of JOTA. The Club would only need two low power 80 metre transmitters and several receivers.

(d) The Club would then encourage youngsters to build their own receivers under the guidance of Club members. The Club could arrange simple competitions before JOTA, so that on the day everyone would be ready. All that is needed for this is two transmitters and have the competitors starting one at a time. The shortest time is the winner. This means less equipment is required. We are waiting on a sample 80 metre kit from China to use as a basis."

So, there are some further thoughts to add to mine. Hopefully, some more ideas will appear in the future.

Next Region 3 ARDF Contest

Some more from Wally. "It has been confirmed that the next Region 3 ARDF Championship will be held in South Korea around September 1999. We are looking for a full team of 12 from Australia. In order to get young people to participate there, perhaps Clubs, through the suggested activity with JOTA, may be willing to raise funds to help sponsor or subsidise a suitable recruit."

So far there has been no offer of financial support for the Region 3 championship from the WIA Federal, or any Division"

ARDF Activity

Over the weekends of 27/28 September and 4/5 October, I attended the Townsville Convention and the Central Highlands Clubs Fairburn Dam weekend. It is pleasing to report that there was quite a reasonable amount of ARDF activity at both events.

Further "Fox" Development

For the last few months I have been experimenting with an MC 13175 IC. This 16 pin surface mount device is a single chip crystal controlled signal source designed for 260 to 470 MHz operation. It uses a phase locked loop (PLL) and may be modulated in a variety of ways. One application I had in mind was to try and use it as a miniature "fox" at 144 MHz.

The first consideration was to determine if it would work "down" on 144 MHz. This is satisfactory, and with an 18 MHz crystal in conjunction with the chips divide-by-eight from the signal frequency down to the PLL input, the voltage controlled oscillator (VCO) runs at 144 MHz and direct output is obtained at that frequency.

Output power was measured at two milliwatts with a three volt supply. Initial tests were satisfactory at a 200 metre range using a quarter wave wire antenna on the fox and the usual "sniffer" type receiver. The maximum range is yet to be established.

Further circuitry was developed to pulse the transmitter on for a few milli-seconds every second. This serves both to identify the device and reduce power consumption. The unit, together with two "N" size cells, is fitted into a metal box measuring 25 x 25 x 35 mm. So watch out, foxes are getting smaller!

ARDF Groups and Contacts

As mentioned in the October column, I will endeavour to supply a list of Groups that are active in ARDF related matters plus a contact person for that Group.

I think the largest and most active would be the **Melbourne Fox Hunting Group**. This, I am informed, is made up of people from a number of clubs in the area plus other individuals, all with an interest in ARDF. For those with Internet access, they have a web page at <http://www.ozemail.com.au/~amac/fox/fox.htm>

They also have a mailing list/reflector to which one may subscribe via their Web page, or by sending a message with **subscribe melb-fox** in the body of the message to **majordomo @ planet.net.au**.

For a general contact person, I suggest **Mark Diggins VK3JMD** (03 9558 2959; e-mail **mdiggins@netspace.net.au**). Mark

may then put you in contact with someone else who has the specific knowledge to handle your enquiry. Incidentally, Mark, plus others, will be telling us more about this Group with a major contribution to the February column.

For the **Redcliffe and District ARC**: Jason Morris VK4YOL (07 5495 3845) is the Club ARDF co-ordinator. Also, Barrie Hill VK4ZOO (073 869 1141; e-mail **barrie@ecn.net.au**), who has been involved with ARDF activities for some years now.

Townsville ARC. Don Terrace VK4MC (077 88 6665 [AH], 077 25 1822 [BH];

e-mail **dterrace@ozemail.com.au**) Don is doing some good work in Townsville.

Wally VK4DO, PO Box 432, Proserpine QLD 4800 (079 47 1036; Fax 079 47 1848) is the Club plus VK4 ARDF co-ordinator.

Yours truly has set up a "web page" with a large ARDF content at: <http://www.mackaynet.au/~ron>

Please let me have details of a contact person if you or your Club are involved in any ARDF type activities.

*PO Box 323, Sarina QLD 4737
E-mail **mangraham@magnet.com.au**
Packet VK4BRG #VK4BRG #CQ QLD AUS OC

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Awards

*John Kelleher VK3DP - Federal Awards Manager**



The ZL2000 Award certificate for 1998. It is a full colour certificate measuring 297 by 210 mm.

Another year drawing to a close, and I am still asking for information on local awards. Some of the more progressive groups have come to the fore, but I am still waiting for some movement from the rest, particularly those on the list that I had reason to publish at an earlier date. Believe me, when the bands start to activate again, you will thank me for persisting.

I now know that we have an Awards Manager in VK2. What about the rest of the States? And what about two metres and above? It is downright embarrassing to have to beg for good information which will, in the end, be valuable to all and sundry!

Israel's 50th Anniversary Award

The Israel Amateur Radio Club announces a special activity to commemorate the Jubilee of the State of Israel, and the establishment of the IARC.

The activity starts on 1 January 1998 and ends at midnight on 1 May 1998, which is Israel's 50th Independence Day. The aim is to contact as many Israeli radio amateurs as possible. Contacts with Israeli stations will be counted once only, regardless of band or mode.

To honour the IARC founders, a special callsign will be used by those amateurs who belong to the founders group (Pioneers). They will use the prefix 4X50.

Special event stations will be active to commemorate Silent Keys, many of whom belonged to the founders group. These stations will use the 4X50 prefix and the Silent Key's old suffix, ending with /SK. For example 4X50BX/SK.

Each contact with an IARC member will count one point. Each contact with a Pioneer Station will count five points. The following points are required for the awards. Basic: 50

points including two Pioneer stations. Bronze: 100 points including four Pioneer stations. Silver: 150 points including six Pioneer stations. Gold: 200 points including eight Pioneer stations. Platinum: 250 points including 10 pioneer stations.

For SWLs the same rules apply, providing the log extract shows the particulars of both stations heard.

A special 50th Anniversary "Israel State Medal" will be awarded to the three highest scores in each of the IARU Regions 1, 2 and 3. Logs must be sent to the IARC Awards Manager before 30 June 1998 at PO Box 17600, Tel Aviv 61176 (please note that there was no mention of fees included in the information which I received). Tel/Fax: 972 3 534 6049. E-mail: joseph@shani.net

Best 73 and shalom, from Joseph Obstfeld 4X6KJ.

The ZL2000 Award

Now for one of those popular annual awards. The amateur fraternity is fast heading into a new century, with the year 2000 rapidly approaching. To acknowledge this event, the Gisborne Amateur Radio Club (Branch 11 NZART) have instigated an annual award UNTIL the year 2000, using the call sign ZL2000.

The award, known as the "Gisborne 2000 Award", highlights the fact that Gisborne, New Zealand is unique in being the first City in the world to greet the sunrise on a new day, and the New Year. Gisborne will be the centre of attention for much of the world during the New Year period of the year 2000.

As this is an International Award, it is therefore open to all amateur radio operators and SWLs. To achieve an annual award, only ONE contact is required with a ZL2000 station during the month of January each year, until the year 2000.

A special complimentary Award will be issued to all stations that contact a ZL2000 station for FOUR out of the possible five years of the award, up to and including the year 2000. One of these complimentary award recipients will receive a very special award in the year 2000, the details of which will be released at a later date.

The fee for the annual award in New Zealand is \$NZ5.00. For VK operators \$AU\$5.00, and for the rest of the world \$NZ10.00. All correspondence and Award applications should be sent to Gisborne 2000 Award, PO Box 1017, Gisborne 3815, New Zealand.

Rules for the ZL2000 Award

- (1) The Award will be available to all licensed amateurs and SWLs.
- (2) Only ONE contact is eligible per year

with one of the Gisborne stations using the ZL2000 callsign.

- (3) All operators using the ZL2000 call sign must be full members of the Gisborne Amateur Radio Club.
- (4) Any valid amateur frequency may be used by Phone or CW.
- (5) Contacts can only be made during January of each year.
- (6) The Award commences at 0001 hrs (NZ time) 1 January 1998 (1101 UTC 31 December 1997) and concludes 2400 hrs (NZ time) 31 January 1998 (1100 UTC 31 January 1998, and each year including the year 2000).
- (7) All valid contacts with a ZL2000 station will be sent a QSL card via the NZART QSL Bureau.
- (8) The Award for each year will be

issued on receipt of the prescribed application fee.

- (9) The application fee for the award should reach the Award Manager by 30 June of the operating year (late entries will be processed at the discretion of the ZL2000 Awards committee).
- (10) A different pictorial award will be issued each year.
- (11) Any operator or SWL collecting four awards, including the year 2000, will be issued with a complimentary award.
- (12) One amateur operator or SWL meeting the requirements of Rule 11, will be chosen to receive a special award in the year 2000.

*4 Brook Crescent, Box Hill South, VIC 3128
Phone (03) 9809 8393*

HF

Club Corner

Central Coast Amateur Radio Club

The Central Coast Amateur Radio Club, a club well known for its annual Field day or Hamfest, is on the warpath. Its membership, as with most similar clubs, has diminished somewhat over the years.

The Club, after careful consideration and being sick of the doom and gloom talk and attitude in our hobby, has now appointed a "Promotion Committee" with the order "GO GET THEM".

This committee has set itself an agenda to increase membership, have radio interviews about our hobby, organise "hands-on demonstration evenings" for the public, begin an advertising campaign, and treble the number of students in the annual license courses. A tall order indeed, but already the signs are there that it is working. The committee has commenced advertisements in the Central Coast newspapers, has produced attractive brochures, and the general public has shown remarkable interest.

They have used the Limited Novice licence (no CW) as "bait", as it is felt that, after obtaining the first licence, the natural curiosity of the student will do the rest, a fact which already has been proven.

The club has taken the bit between its teeth and is getting away from the gloom attitude. The CCARC is of the opinion that, with the thousands of CBers about, many must be sick and tired of the restrictions placed on them; this also has been proven correct.

The Club is taking the attitude of not

complaining and blaming the Internet, e-mail, CB or mobile phones for the decline of, or lack of new, interest in this great Amateur Radio Movement of ours, but is going out and doing something about it. The campaign committee strongly believes that the number of members can be doubled and the number of new student licensees can be trebled.

Optimistic? Not according to the Central Coast Amateur Radio Club.

Peter Rysdyk VK2FFA
CCARC Promotions Committee

The Australian Naval Amateur Radio Society (ANARS)

Established for radio amateurs and interested SWLs who have a professional Naval or Maritime background, ANARS welcomes enquiries from serving and past members of the Royal Australian Navy, Australian Merchant Navy, RANR, WRANS, RANVR, Naval Reserve Cadets and Civilian Support Staff of the RAN who have an interest in amateur radio.

Membership enquiries are also welcomed from those who have served in any foreign Navy, Merchant Navy or Naval Reserves and who are now Australian Citizens or have been granted permanent resident status in Australia.

Foreign Amateurs with similar nautical background are welcome to apply for Associate Membership of the Society.

ANARS is affiliated with the WIA, and the aims of the Society include:-

- * Encouraging the hobby of amateur radio within the RAN and the Australian Merchant Navy.

* Bringing together all radio amateurs and interested short wave listeners with a professional naval or maritime background.

* Co-operating with overseas naval/maritime amateur radio organisations for mutual benefit.

* Representing the interests of Australian naval or maritime amateur radio internationally.

Active ANARS amateur operators are resident in every state, the ACT and the Northern Territory. Also included are offshore islands, New Zealand and some overseas countries.

Two "Navy Nets" are conducted each week in the Novice segment of the 80 m band on Mondays at 3532 kHz (+/- QRM) at 0930 UTC, CW mode; and Wednesdays on 3620 kHz (+/- QRM) at 0930 UTC, SSB mode.

In addition, two SSB nets are conducted every day on 7075 kHz (+/- QRM) at 0400 UTC; and on 14175 kHz (+/- QRM) at 0430 UTC. All are welcome to join the various nets.

For further information on the Society and its activities, please contact the Secretary of ANARS by writing to PO Box 482, Parramatta NSW 2124, or by phone on 02 9630 6670. Alternatively, call in to any of the "Australian Navy" nets where members will be only too pleased to assist you.

Our common bonds are the sea and radio. ANARS is Australian and proud of it!

50th Urunga Radio Convention

The 50th Urunga Radio convention will be held at Urunga, commencing on the morning of 11 April 1998. This convention is the first and longest continuous running radio convention in Australia. Not all, but most of the fox-hunting, and twists to fox-hunting, were devised at Urunga.

Many people have attended this convention over the years but, unfortunately, many of the early participants are now Silent Keys.

The technical advances seen in radio since the inception of the convention have, to say the least, been staggering. For example, the efficiency and power savings from the early VHF modulated oscillator transmitters and super regenerative receivers operating on two metres and powered by large 12 volt lead batteries, to the modern palm-sized transceiver covering from 50 MHz to 1 GHz on receive and 2 m and 70 cm on transmit.

Special certificates will be issued to all who attend the 50th convention. Further information can be had on the Internet; or from the committee, who are: VK2s ADA, DMS, YCI, DGT and ZCQ, or by mail to: PO Box 8, Bellinger NSW 2454.

B J Starke VK2ZCQ

RAOTC

If you were licensed in 1972, or earlier, you are eligible for membership of the **Radio Amateurs Old Timers Club of Australia**. Age has no bearing on eligibility.

As at December 1997, \$12.50 will cover the joining fee of \$2.50 and membership to 30 June 1999! For this you will receive the March and September 1998, and the March 1999 issues of the club magazine *OTN*, plus, of course, the fellowship of an Australia-wide group of long time radio amateurs.

For membership application details, please contact Arthur Evans VK3VQ, Milton Crompton VK3MN or Allan Doble VK3AMD. All are QTHR.

Allan Doble VK3AMD



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WIA News

Good Publicity for Amateur Radio

The Space Pilots Club, a Toowoomba youth group interested in rocketry and space, held their annual father/son camp at Shannon Park in the countryside north of Toowoomba, over the weekend of 25-26 October.

As "communicating" was the theme for the weekend, the Darling Downs Radio Club (DDRC) was invited to participate. The DDRC set up two HF stations, one on sideband, and the other on CW. A number of contacts were made with stations in Croatia, the United States and Antarctica (VK0ANARE).

Other displays allowed visitors to try their hand at sending Morse to a computer, and demonstrated some satellite tracking programs.

In view of the Space Pilots' interest in rocketry, one DDRC member also brought along for display a fine collection of photographs from when he worked at Woomera in its heyday.

Amateurs involved were Tom VK4BTW, Dennis VK4ADY, Keith VK4NCM, Terry VK4KTP, and Ivan VK4BIB, who also did all the hard work in co-ordinating the displays. (Thanks to Terry Walters VK4KTP, via WIAQ newsman, Graham Kemp VK4BB).

[Released 11/11/97]

Contests

Peter Nesbit VK3APN - Federal Contest Coordinator*

Contest Calendar Dec 1997 - Feb 1998

Dec 5/7	ARRL 160 m Contest	(Nov 97)
Dec 13/14	ARRL 10 m Contest	(Nov 97)
Dec 20-21	Croatian CW Contest	(Nov 97)
Dec 27/28	Stew Perry 160 m Challenge	(Nov 97)
Dec 27 - Jan 25	Ross Hull VHF/UHF Contest	(Nov 97)
Dec 28	RAC Canada Winter Contest	(Nov 97)
Dec 31	ARRL Straight Key Night	
Jan 3-4	ARRL RTTY Roundup	
Jan 9-11	Japan International DX CW (Low Band)	
Jan 10-11	VHF/UHF Field Day Contest	
Jan 17-18	HA DX CW Contest	
Jan 23-25	CQ WW 160 m DX Contest	
Jan 24-25	REF (France) CW DX Contest	
Jan 24-25	UBA (Belgium) SSB DX Contest	
Feb 7-8	YU DX Contest	
Feb 14	Asia-Pacific CW Sprint	
Feb 14-15	PACC CW/SSB DX Contest	
Feb 20-22	CQ 160 Metre SSB Contest	
Feb 21-22	RSGB 7 MHz CW Contest	
Feb 21-22	REF (France) SSB DX Contest	
Feb 21-22	UBA (Belgium) CW DX Contest	
Feb 21-22	ARRL DX CW Contest	
Feb 22	High Speed Club CW Contest	

While putting the contest calendar together this month, I noticed that next February is unusual in that it has only three full weekends. This means that, according to the published rules, there will be a total of at least six contests occurring on the weekend of 21/22 February!

No doubt the respective organisers have also noticed this clash, but whether anyone has changed the date of their contest to avoid it is anyone's guess. Over the next month I'll try to find out more information. In the meantime, please treat the listings for 21/22 February with care.

The RD Contest results have arrived, and once again VK7 takes the crown. Well done everybody!

The outcome could have been very different, however, if more stations had sent in their logs. As the RD Manager Alek VK6APK points out, the VK2 Division would have won the contest if a particular VK2, who was reasonably active on VHF, had submitted his log. However, he did not, and VK2 lost as a result.

The message is clear. If Divisions are really serious about winning (which of course they are), it's up to them to make sure that all their entrants submit logs. This is especially important considering that entrants automatically give points to other Divisions when they make contacts, at least on HF, so not to submit a log actually COSTS their Division and makes it HARDER for them to win.

The Divisions could almost tell their members that, if they don't intend to submit logs, don't enter the contest! However, nobody in his right mind wants that, so next August PLEASE enter the RD

and PLEASE submit your log. The ball is in the court of the Divisions to keep reminding their members of the necessity to send in their logs.

Finally, I want to wish everyone a very Happy Christmas.

For information this month, thanks to VK3KWA, VK4VW, VK6APK, OB4BUK, and CQ Magazine. Until next month, good contesting!

73, Peter VK3APN

CQ Worldwide 160 Metre DX Contest

CW: 23-25 Jan, 2200z Fri to 1600z Sun

Phone: 20-22 Feb, 2200z Fri to 1600z Sun

The CW and Phone sections of this contest are scheduled for the fast full weekend of Jan and Feb each year. The object is to contact as many stations world-wide on 160 m as possible. *VK to VK contacts are permitted for contest credit*. Categories are single and multi-operator. The use of packet, a spotting net, or logging assistant makes you multi-op. Suggested DX frequencies are 1830-1835: W/VEs will usually operate outside this window. Look for Japan on 1907 kHz.

Exchange RS(T) plus prefix or country abbreviation (VK). W/VE will send RST plus state/province. Score two points for contacts with stations in own country, five points with stations in other countries in the same continent (continental boundary as for WAC), five points for contacts with I/M stations, and 10 points with stations in other WAC continents.

Multiphers are US states (max 48); Canadian provinces (max 13); and DXCC & WAE

countries. Maritime mobile stations no longer count as multipliers. The final score equals the total QSO points times total multiplier (US states + VE provinces + DX countries). Indicate CW or SSB on the envelope, and mail the log and paper summary sheet to: 160 Metre Contest Director, David Thompson K4JRB, 4166 Mill Stone Court, Norcross, GA 30092, USA. Mailing deadlines are 28 Feb for CW, and 31 March for SSB.

Results of 1997 Jack Files Memorial Contest

Presented by Peter Dawson VK4VW (ex VK4EFX)

22 logs were received, all of which were well presented. Some of them included useful comments and suggestions, which will be looked at prior to next year's contest. Trophies and certificates will be posted in the next few weeks.

CW:

1	VK4EMM *	4323
2	VK3APN	2074
3	VK1WI	924
4	VK4BAZ	728
5	VK4ICU	490

Phone:

1	VK4PJK *	9520
2	VK4BAZ	8056
3	VK4AGW	7035
4	VK4MGA	6528
5	VK4MOJ	5776

6	VK4DO	1219
7	VK1WI	714
8	VK4JAE	504
9	VK1PK	468
10	VK2LEE	385

11	VK4PVH	202
12	ZL1AGO	130
13	VK5UE	126
14	VK4BAR	3017
15	VK1PK	130

Club:

1	L40380	9520
2	Highest Novice Overall:	
3	VK4PJK *	9520

*Denotes trophy winner. All entrants will receive a certificate of participation.

RESULTS OF 1997 RD CONTEST

Presented by Alek Petkovic VK6APK
VK7 Wins Again!!

For the second year running we congratulate the VK7 Division for their great effort in winning the 1997 Remembrance Day Contest. The winning margin was not as great this year as it was in 1996, but it was still a strong and well-deserved win.

It was a hard slog for all Divisions this year, as we were still very much in the doldrums as far as HF propagation was concerned. The 10 and 15 metre bands were virtually unusable this year because of the poor conditions. This was not such a worry for full call stations, as conditions on 20 and 40 were quite good. I am in full admiration of the Novices who were virtually confined to 80 m, and so were only able to operate during the hours of darkness. It was fortunate that conditions were

so good on 80, because it allowed some of them to amass some very large scores for their Division.

The standard of logs was excellent this year, making the task of checking and calculation very easy. A big disappointment, however, was the fairly low number of logs submitted compared to the number of stations who took part. In the course of checking the logs, I was quite amazed that in VK6, the return rate for both HF and VHF logs was just 58%. Also, the 42% of stations that did not submit logs were not "tail-enders" whose score would not have done much to help their Division. In VK6 for example, their points would have boosted the Divisional score by more than 30% on VHF and by 25% on HF!

It was evident that all Divisions suffered this problem to varying degrees. Perhaps the most outstanding example is that of a VK2 station, who had at least 175 points on VHF that I know of, who did not submit his log. Had he done so, VK2 Division would now be the proud holders of the title for 1997!

In 1998, think of what YOUR log means to your Division, and then send it in to be counted. It WILL make a difference.

Divisional Scores

The method used to determine the winning Division using "Benchmarks" and "Improvement Factors" was published with the rules on page 38 of *Amateur Radio* July 1997. Readers who wish to do their own calculations are referred to that issue of the magazine.

Table 1 shows the placing of each Division, along with their overall Improvement Factors.

Table 1: Divisional Ladder

1st	VK7	1939
2nd	VK5/8	1239
3rd	VK2	1033
4th	VK4	917
5th	VK6	747
6th	VK3	503
7th	VKI	402
The total scores in both the HF and VHF sections are shown below in Table 2.		

Table 2: Divisional Scores

Div'n	HF	VHF
VKI	441	68
VK2	5049	67
VK3	3183	3324
VK4	4879	410
VK5/8	3104	2229
VK6	2711	4089
VK7	2014	538

The above totals were used to calculate the Improvement Factors, which determined the winning Division. They have also been used to calculate the Benchmarks to be used for next year's contest. These Benchmarks, which are shown in Table 3, are the scores that must be surpassed by each Division in order to register an improvement. They will be published again with the rules in July 1998.

Table 3: 1998 Benchmarks

Div'n	HF	VHF
VKI	720	212
VK2	4523	72
VK3	4106	9602
VK4	3682	988
VK5/8	3586	1571

VK6 2897 6331

VK7 1949 277

Individual Scores

The individual scores for entrants are listed below. Certificate winners are denoted by an asterisk (*), and the top Australian scores in each section by a hash (#). This year, for the first time, certificates will be issued to both the top single operator and top multi-operator stations in each division.

VKI	EA	214	BWT	5	GRG	97
HF Phone	SAY*	187	VK4	5	NN	85
DW*	AHY	166	HF Phone	EJ*	XY	60
RN	CAT	118	NSW	381	RK	39
SW	JK	107	BAY	230	WO	36
2EY/I	EK	104	WW	215	KCX	30
HF CW	XK	93	BAF	164	NF	27
AU*	INCO/3	84	BTW	157	ANW	25
PK	ABP	80	AAH	110	EV	13
VHF Phone	DY	68	KEL	103	BWA	12
DW*	GUS	67	LMB	73	CTY	10
HS	EX	63	ACW	70	HF CW	
RG	DVT	61	BSH	61	AGX*	134
2EY/I	AMW	50	AKI	54	GZ	126
VK2	BWT	50	PJ	51	HO	116
HF Phone	KQB	50	DI	49	XE	84
CAA*	MDT	50	JAE	49	8HA	64
XN*	MSL	50	SJ	48	BS	38
CM	ADW	45	AWL	41	HF Open	
DCL	ALD	41	BRG	41	BRC#	648
SHA	DBQ	41	IL	30	ATU*	320
XT	OW	39	DV	24	8AV	44
LEE	KTO	32	VY	24	VHF Phone	
XH	GIMS	25	IS	22	BRC*	367
AGF	DCP	21	UQ	16	AKK*	301
EP	CAM	13	ADY	13	THA	246
LO	EST	13	FK	11	GRG	191
BDT	CRP	11	HF CW		ZKK	108
WI	XH	1	LV*	256	BJM	100
FY	HF CW		XW	208	AJS	88
ALZ	APN*	238	LP	192	KMI	73
HV	XB	160	XA	132	KCX	71
WF	AMD	102	COZ	106	EV	63
BQS	ANJ	100	RE	80	AVQ	62
UC	PG	96	CI	78	TC	61
ZM	DNG	76	EV	46	KDK	24
KQ	KS	42	BBA	23	KIA	16
AVT	HF Open		VHF Phone		ZRH	12
CF	DID*	98	ZBV*	119	VHF Open	
DOB	VHF PHONE		ZA	29	ANC	239
HF CW	SAA#	537	PJ	25	JP	102
KM#	GUS	519	ADY	15	KG	82
OI	TBM*	449	JI	14	PX	50
DID	AYF	233	CXG	10	AR	43
QF	JK	222	VY	9	APK	36
GS	KTO	201	LUV	8	RU	33
PS	TFS	150	HBV	6	GGN	29
EL	XIU	141	AKI	4	UT	29
CWS	OW	120	KEL	4	BGN	22
AZR	BGS	101	AJH	3	HK	22
HF Open	CAM	100	SJ	3	YF	22
BO*	DBQ	81	BBA	2	KZ	5
RJ	CAT	67	UQ	2	PS	3
FYM	AWS	59	HF CW			
PH	HAY	59	VHF Open			
VHF Phone	CRP	58	AR*	156	AFW	238
BDT*	EST	55	VK5		AJ	192
HV	AGH	49	HF Phone		AF	126
VHF Open	XH	40	GY*	256	VZ	80
TJO*	GMS	27	BJM	253	HF Open	
VK3	DID	21	BP*	251	WT	40
VK4	AHY	15	BWH	198	JS*	77
VK5/8	CB*	15	UE	138	RZ	39
					FK	36

GW	31	VHF Open	CX#	374
VHF Phone	384	VK7	VK7	
NU*	271	HF Phone		
YEI	258	CX*	307	
XV	258	RN	291	
ANC*	257	KC	187	
ZDW	228	PC	181	
AR	186	NDO	151	
FJA	160	KZ	106	
RG	150	JGD	86	
KG	134	KV	81	
APK	126	JP	72	
JP	118	NGC	70	
EH	111	LS	50	
KTN	111	PP	47	
FS	110	SV	31	
GGA	101	RM	31	
CSW	92	AC	30	
MIN	91	BM	25	
GGP	79	HX	20	
RO	74	HFCW		
UE	63	RO*	248	
UT	63	VHF Phone		
UV	57	JGP*	86	
MCB	54	DG	85	
KZ	50	HX	72	
TS	50	HDM	57	
YF	50	ZBX	47	
KWM	40	KV	45	
RZ	39	EB	34	
WT	39	RM	30	
9X2/6	38	LS	25	
GDD	33	NDL	24	
CGIN	28	ASN	13	
BWJ	25	SV	9	
DY	23	PP	6	
SM	20	RN	5	
FK	2			

Thanks go once again to the overseas entrants for their participation and help in making the contest success it is. Unfortunately there are no P2 logs this year, but it is good to see the ZL entries with such high scores. A great effort considering the poor conditions on the higher bands.

Overseas

HF Phone	
ZL1BVK*	360
ZL3TX	248
HF CW	
ZL1ALZ*	152
ZL2ALJ	140

From the experience of this year's contest, there are a couple of issues which require attention for the 1998 contest. Firstly, I would encourage each Division to do their utmost to promote the value of submitting logs. It seems such a shame that so many people put in such a great effort, only to have those efforts wasted because their fellow entrants did not get their logs in to be counted.

The second issue concerns the operation of multi-operator stations. Rule 9 states that only one person may operate at any time. There have been reports of multi-operator stations operating on HF and VHF at the same time. This practice is almost impossible to police, and so I would recommend that this rule be amended or scrapped. In my view it does not contravene any licence conditions, and it is very much in the spirit of the contest in that it encourages participation.

I would like to hear your thoughts on both of the above issues.

That's it for another year I hope you enjoyed the part you played in this year's contest, and will take this opportunity to wish you a Merry Christmas and a happy and successful 1998. I will close, as usual, with some of your comments on this year's RD contest.

"Lack of propagation between VK1 and major communities in VK2 and VK3 made things difficult for VK1". "VK1AU" "A good contest. Some tactical errors lowered my score" ... "VK1PK" "160, 80, 40 and 20 m were open nicely. The solar flux must be improving" ... "ZL3TX" "It would be nice to see the results of local contests. Does the WIA have a web page site?" ... "ZL2ALJ" "A very enjoyable contest which I look forward to".

"ZL1ALZ" "The contest was a lot of fun; activity seemed a little down on previous but then so is the DX" ... "VK2QF" "A real good contest, with some real good fellowship displayed by all. The spirit of amateur radio is alive and well" ... "VK1CB" "Enjoyed the contest once again. Did better than last year" ... "VK1CAT" "I have just moved house and had to unpack boxes to find my AR gear to get a station together" ... "VK1NOMS" "The level of CW competition on Saturday night was more intense than I can remember it for a long time" ... "VK3APN" "Enjoyed the pre-contest talk this year in VK3" ...

"VK3DID" "A feature of this year's effort was the use of a 23 cm handheld. We had to send someone outside to climb the mast whenever a 23 cm contact was attempted" ... "VK3GUS" "It is a pity that this Division did not publicise this contest as hard as in previous years" ... "VK3BGS" "Could you give a certificate to the best Novice performance in each category?" ... "VK4BAF" "The 1st contest I have put a log in" ... "VK4BAF" "This is my 1st contest entered" ... "VK4LMB" "I enjoyed it and worked every state on a 2 metre aerial" ... "VK4HS" "Another good contest but fewer and fewer on the key" ... "VK4LV" "P2 was not heard and ZL seemed to be down on CW" ... "VK4XY" "My results on 15 m and 10 m were way down on last year's effort" ... "VK4EMM" "One of the most friendly and enjoyable RD contests" ... "VK4GZ" "Pity to miss beating last year's score. Main thing is that we had a lot of fun" ... "VSKBCR" "Very happy about the courtesy of operations this year in Adelaide" ... "VSKAR" "Great conditions on 80 m from VK6" ...

"VK6ANC" "Thought my time was best spent on CW due to the double points. I also enjoyed it more" ... "VK6VZ" "It sure gets people back on the air again" ... "VK7JGD"

Ross Hull Memorial VHF-UHF Contest: 1997 - 1998

Presented by John Martin, VKJKA

Since the last contest, I have received a number of comments and suggestions for rule changes. Most of the ideas differ quite radically, and I have come to the conclusion that it is impossible to come up with a single set of rules which will satisfy everyone.

If I followed all of the suggestions I have received, the contest would run on weekends only and seven days a week, for a fortnight and for a month. Six metres would be dropped and retained, and scoring would be based on distance and on locator squares. Band multipliers would be reduced, increased and abolished!

So all I can do is thank everyone for their

contribution, and hope that they will not be offended if the rules haven't turned out exactly as they wished.

Certain of the rules are dictated by the aims of the contest. The major aims are:

1. To stimulate VHF/UHF activity over the summer DX season.
2. To encourage the use of narrow band modes (SSB and CW).
3. To encourage the use of higher frequency bands.
4. To reward achievement in working greater distances.

For the last few years there has been a heavy emphasis on the fourth aim. The scoring system has allowed the best equipped stations to build up large scores from a small number of contacts. Activity has declined, and people with less extravagant stations have not been able to get as many contacts as they expected.

I feel that this approach has run its course, and it is time to shift attention back to the first aim. We need more activity from a greater number of different stations, and we need a big increase in the demand for medium distance contacts.

The contest can be hard work for anyone who wishes to get a high score, and several entrants have argued strongly that the contest is too long. But I come back to the aims we want to encourage more amateurs to flip their mode switches and tune down to the DX end of the band. There is no incentive for them to do this unless they find a reasonable level of activity over a reasonable period of time. Rather than making the contest any shorter, I would rather make it twelve months long!

This year there will be no limit on the number of contacts in the log, but there will be a limit of ten repeat contacts per station per band. This means that logs will need to contain a greater number of different callsigns, and there will be a much increased demand for medium distance contacts. But with the limit of ten repeats, it will not be necessary to work everyone every day - or even every second day.

The other major change is in 6 m scoring, which has been revised to make the scoring potential equal to that of the other bands.

The rule about contest exchanges on DX calling frequencies is unchanged. I cannot be more specific about this rule, for example by setting a limit of so many per day, or so many for the whole contest period. I would just ask entrants to please follow the spirit of this rule and not look for loopholes!

Please note also the frequency restriction on 50 MHz. This has been adopted in line with the world-wide trend to keep a small segment at 50 MHz clear for serious DX operation. There is plenty of room for everyone above 50 150 MHz.

Rules
The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Certificates may also be awarded to top scorers in the various divisions of the contest. The contest is open to all amateurs.

Duration:

0000 UTC Saturday, 27 December 1997 to 2359 UTC Sunday, 25 January 1998. In Eastern Summer Time, that is 11 am on Saturday December 27 to 11 am on Monday, 26 January.

Sections and Awards:

- A Multiband,
- B Single band

All entrants are scored for both sections. The overall winner will be the top scorer in Section A. Awards will also be made to the top scorers in each of the following categories: 6 metres, 2 metres, 70 cm; 23 cm, 13 cm, microwaves.

General Rules:

Single operator only; one station callsign only. One contact per station per band per UTC day, up to a limit of ten contacts per station per band. Cross-band, repeater and satellite contacts are not permitted. A contest calling frequency of .150 on each band is recommended. Entrants must not make contest calls or exchanges on recognised DX calling frequencies unless conditions make it impractical to change frequency. On 6 m, no contest activity is permitted below 50.150 MHz. All rulings of the Contest Manager will be accepted as final.

Penalties:

Errors in calculation will not incur any penalty. Entrants who fail to abide by the terms of their station licences will be disqualified. Repeated abuses of calling frequencies, and any contest operation below 50.150 MHz, will lead to disqualification.

Contest Exchange:

RS (or RST) plus a serial number. Serial numbers need not be consecutive, but consecutive contacts must have different serial numbers.

Scoring:

For 2 m and above, each contact will score one point per 100 km or part thereof (ie. up to 99 km 1 point; 100 - 199 km: 2 points, etc.) On 6 m, as above, for contacts up to 1999 km. Contacts of 2000 km or more will score 25 points.

The band multipliers are:

6 m	2 m	70 cm	23 cm	13 cm	Higher
x1	x4	x7	x10	x13	x16

Logs:

Logs must contain the following for each contact:

- Date and UTC time.
- Station location (if operating portable).
- Frequency and callsign of station worked.
- Location or Maidenhead locator of station worked (if not QTHR)
- Reports and serial numbers sent and received.
- Estimated distance worked and points claimed.

Separate scoring columns, or separate logs, for each band would be helpful. The Contest Manager reserves the right to correct distance estimates on the basis of computer calculation.

Cover sheet:

Logs must be supplied with a cover sheet containing:

Operator's callsign, name and address.

- Station location (if different from the postal address)

A scoring table set out as the example below

A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final

Deadline:

Logs must be received by Monday, 23 February 1998. Early logs would be appreciated. Post logs to: WIA Ross Hull Contest Manager, PO Box 2175, Caulfield Junction, VIC 3161.

Sample Scoring Table:

Band	6 m	2 m	70 cm	etc
Score	XXXX	XXXX	XXXX	XXXX
Band				
Multplier	x1	x4	x7	xx
Total	XXXXXX + XXXXXX + XXXXXX + XXXXXX =			XXXXXX (GRAND TOTAL)

Note on Calculating Distances:

Absolute accuracy is not required. All you need to know is whether the distance is above or below the nearest multiple of 100 km. An easy method is to use a compass to draw 100 km circles around your location on a map. Better estimates can be made from six-digit Maidenhead locators, using a simple computer program published in *Amateur Radio* in December 1996. A more accurate and fully error-trapped program is available which also includes calculation of bearings and conversion between lat/long and Maidenhead locators. It is available in IBM format only, from John Martin VK3KWA (QTHR). If you send a floppy disc (any format) to a mailing box, together with return postage.

VHF/UHF FIELD DAY 1998

Presented by John Martin, VK3KWA

The annual VHF/UHF Field Day will be run on the weekend of 10/11 January 1998. The Ross Hull Contest will be in progress at this time and all contacts can be counted for both contests.

The overall duration of the Field Day is 28 hours, but operation is for any 6 or 24 consecutive hours within this period. The reason for the extra hours is to make it possible for 6 hour entrants to operate on the Sunday without having to be set up and ready by daybreak. Please feel free to give numbers to any station that asks, even if your 6 or 24 hour period has finished!

The 6 m band was dropped last year, and there has been a strong demand for it to be reinstated. This has been done, but please note the frequency restriction: there must be no contest activity on 50.110 MHz or any other frequency below 50.150 MHz. The usual rule about DX calling frequencies on other bands still applies. A contest calling frequency of .150 on each band is suggested.

A further change is to allow contacts between home stations. Why not? The more activity the better!

Finally, two requests. To organisers of club stations, please don't forget to include the names and callsigns of all operators! And to all entrants, please enclose any comments and suggestions with your log.

Oh yes, now that I think of it, a third request. Head for the hills that weekend and have fun! Or stay at home if you prefer, but just get on the air and have fun.

Duration:

VK6 only: 0300 UTC Saturday, 10 January to 0700 UTC Sunday, 11 January. All other call areas: 0000 UTC Saturday to 0400 UTC Sunday.

Sections and Awards:

Entrants may submit logs for one of the following sections.

A: Portable station, single operator, 24 hours.

B: Portable station, single operator, 6 hours.

C: Portable station, multiple operator, 24 hours.

D: Home station, 24 hours.

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scores in Sections B, C and D.

General Rules:

Operation may be from any location, or from more than one location. You may work stations within your own locator square. Operation must be for any 6 or 24 consecutive hours. Repeater, satellite and cross band contacts are not allowed. A station is portable only if its equipment, including antennas, is transported to a location other than the normal home location of its operator.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies should not be used for contest exchanges or liaison.

One callsign per station, and one station per operator. If two operators set up a joint station, they may enter as a multi-operator station under a single callsign, or as separate single operator stations. Stations with more than two operators must enter section C.

Contest Exchange:

RS (or RST) reports, a serial number, and your four digit Maidenhead locator.

Repeat Contacts:

Stations may be worked again on each band after three hours. If the station is moved to a new locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Scoring:

For each band, score 10 points for each square in which your station operates, plus 10 points for each locator square worked, plus one point per contact. Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	13 cm	Higher
x1	x4	x7	x10	x13	x16

Then total the scores for all bands.

Logs:

For each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

The front sheet should contain names and callsigns of all operators; the postal address which applies to the callsign used, station location and Maidenhead locator; section entered, the period of operation to be scored, a scoring table, and a signed declaration that the Contest Manager's decision will be accepted as final.

Sample Scoring Table:

Band	QSO Pts	Locator Pts	Multplier	Total
2 m	120	+	x4	= 160
70 cm	60	+	x7	= 420 etc.
Overall Total				3000

Entries:

Post logs to: The Manager, VHF-UHF Field Day, PO Box 2175, Caulfield Junction VIC 3161. Logs must be received by Monday, 9 February, 1998. Early logs would be appreciated.

P.O. Box 2175, Caulfield Junction, VIC 3161

pmbst@melbpc.org.au

Divisional Notes

Forward Bias - VK1 Notes

Hugh Blemlings VK1YYZ

Season's End

The end of another year is upon us and, as always, is something of a time for reflection. For my part it's certainly been a busy one and empirical evidence suggests that the years get busier as you get older up until you retire, whereupon things get really busy and you have no free time at all...

It has been an eventful year for both the VK1 Division and for the WIA as a whole. Exercises, outings and social events have given us a full calendar and the hope is to continue this trend in 1998. As in all things your input is welcome either in the form of suggestions for events or by volunteering to organise something or present a meeting topic. Neither need be an arduous task and you may rely on support from others in anything you undertake.

The Year Ahead

As in years past, there will be no meeting in December as the 22nd sees us well and truly in the heart of the Christmas rush. The first meeting in 1998 will be on 19 January rather than the 26th to avoid a clash with Australia Day. This meeting will be at the Griffin centre at 8 pm as usual and will be a good opportunity to welcome in the new year with fellow amateurs. There will be a short presentation on a technical topic (as yet undetermined) as well as a selection of democratically chosen light refreshments.

The January meeting will be the last for the present committee; as noted previously there are positions available and your involvement is welcomed. The AGM will be held on 23 February. Please attend if you are able as last year we nearly missed out on a quorum due to low attendance.

In closing all that remains is for me to wish you and your families a happy Christmas and a prosperous new year.

VK2 Notes

David Thompson VK2NH

Tis the Season

At this time of the year it is customary to wish everyone the compliments of the season and the very best for the coming new year. I would like to do just that on behalf of the NSW Division of the Wireless Institute of Australia. As we move on toward the holiday season, just a word of warning: don't get too much RF over the break and see you back safe and well in 1998.

Might be a Record

Recently I learnt that that we have a new amateur in the ranks who is fresh faced and smart all at the same time. Thomas Nott sat his examination at the Hornsby and District Amateur Radio Club in October and came out with flying colours. He made only two errors in the regulations, two errors in the full-call theory and flew through the 10 wpm CW examination. Congratulations Thomas and look forward to catching up with you somewhere on air.

We don't know Thomas' call yet, but I do suspect that this result might be a record for the AOCP as Thomas is only 15½ years of age. Is it a record? If you have information on other younger people who have obtained their full-call, all in one go, please let me know.

Blue Mountains Amateur Radio Club

As you might know by now, VK2 Councillors of the WIA are in the habit of visiting affiliated clubs throughout the state of NSW. We also will be happy to visit non-affiliated clubs on invitation. On Friday night, 7 November it was my pleasure to visit the BMARC Club, which meets at the Springwood High School in the Blue Mountains. I arrived while the general part of the meeting was underway and enjoyed a chat on a technical subject which constituted part of a project the club has planned. After that it was my chance to get to know all present and chat with them about their perceptions of what both the hobby of amateur radio and the WIA should deliver to them.

As I get to visit more clubs over the coming months and I am able to talk about the visits of our Councillors to clubs in the north, south and west of the state, I will try to construct a logical sequence of subjects discussed in order of apparent importance to the amateur fraternity. Already this pattern is emerging and does question a lot of the topics which run close to the very debates which might possibly prove to be catalysts in changing the face of amateur radio. Thanks to the members of the Blue Mountains Club for your warm welcome and very stimulating discussion.

Affiliated Clubs Conference

By the time you read this, and barring hell and high water, the Conference of Affiliated Clubs will have been held at Amateur Radio House at Parramatta. The conference was scheduled to begin on Saturday, 15 November, at 0900. In the next issue of *Amateur Radio* I will talk about some of the

issues discussed and the outcomes. The conference is an excellent way for affiliated clubs to get action on issues for the membership.

Christmas Function

Saturday, 13 December this year is the day we all get together for a little Christmas cheer and fellowship to celebrate the end of the year and the coming holiday season. Any members of the Wireless Institute NSW Division are invited to attend. For details, phone the office.

Office Hours Over the Holidays

The Divisional office of the VK2 Division at Parramatta will close at 2 pm on Monday, 22 December 1997 and will reopen on Monday, 12 January, 1998. The Sunday broadcasts will not go to air on Sunday, 28 December 1997 and Sunday, 4 January 1998, but will recommence on Sunday, 11 January 1998. The answering machine in the office will be checked, otherwise give your favourite Councillor a call. Just try to avoid New Year's Day until late.

E-mail Address

This might look very similar to last month's reminder about our recent change of Divisional e-mail address. If you are addressing e-mail to the office, please do so at vk2w1@ozemail.com.au.

If you would like to contact the VK2 Division regarding your hobby, please do not hesitate to contact the office or any of the Councillors. We will be only too pleased to hear from you. If you would like to get in touch with an individual Councillor, just contact our Divisional office and it will be arranged. Our free-call phone number is 1 800 817 644 and our address can be found on the WIA Divisions' page.

Next Month

In the next column we'll have more to report, including arrangements for the holiday period, such as broadcast dates and times and office opening hours, but if you have anything you would like us to include as VK2 news, send it to me at PO Box 82, Springwood NSW 2777; or by e-mail to dthom@penrithcity.nsw.gov.au

VK3 Notes

Barry Wilton VK3XV

Christmas Holidays

The WIA Victoria office will close on 18 December 1997, at noon, and reopen on 10 February, 1998. Membership applications received by post during this period will be processed. A recorded telephone message on the WIA Victoria office number (03 9885 9261) will provide emergency contact

information for various officers, and WICEN.

Sunday Broadcast

The last broadcast from VK3BWI for 1997 will be on 7 December. This will be the last broadcast from the Lyndhurst site as the property has been sold. The Broadcast Coordinator, Steve Bushell is currently overseeing the construction of new equipment and arranging an alternative site. Steve expects a regular broadcast will resume on the first Sunday in February, 1998. Primary transmission will be on VHF and UHF via the repeater network, and relayed on 80 m and 40 m, if suitable volunteer members can be found to conduct the service on a regular basis.

WIA Victoria Web Site

Our Web site, currently located at www.tbsa.com.au/~wiavict/, is proving to be popular and has been directly responsible for the recruitment of a number of new members. The service will be expanded next year to include regular WIA Victoria news segments. We are in urgent need of a regular news writer and would appreciate any assistance from a member who has some journalistic ability, and preferably is conversant with HTML files. We are most appreciative of the efforts of Krystel Proctor, Keith VK3FT's daughter, for the design work and maintenance of the site.

New Direction for Federal WIA

Major changes in the structure and operation of the WIA Federal office can be anticipated early in the new year. The VK2 Division have advised they will be assuming responsibility for their own membership records from January 1 and from that date will contribute less money in support of the Federal office. A precedent was established when the federal Board of Directors allowed the VK4 Division to reduce their subscription to Federal in respect of all their members by \$5.50 per head. Major changes are imminent in Victoria and it is expected all members of the Federation (Divisions) will be required to restructure, and provide a number of services which are currently the responsibility of the Federal body.

EMR Health Hazard

The effect of Electro Magnetic Radiation on community health is destined to become a significant issue both politically, and with the ACA. WIA Victoria is closely monitoring investigation results in order to prepare for any possible effect on amateur transmissions from metro and other densely populated areas.

Outward QSL Bureau

Some minor changes will be announced in

February. A degree of restructuring is necessary to offset a huge increase in overseas mailing charges implemented by Australia Post. The number of cards being processed is expected to increase as propagation continues to improve.

AR Publicity Opportunity

World Amateur Radio Day will be celebrated in April 1998. This will provide an ideal opportunity for individual Victorian groups and clubs to co-ordinate publicity for our hobby within the community.

WICEN

This summer promises to be one of extremely high fire danger. WICEN operators are well prepared to be of service to the community.

Christmas Greetings

Council wishes all members a Merry Christmas and a Happy New Year.

VKS Notes

Ian Hunt VK5QX

Satellites and Reminiscing

In these notes I refer to the launch of a commemorative satellite and tell of some of my experiences over the years. The satellite was launched "by hand" by a cosmonaut from the MIR Space Station in early November.

"Re-living" History!

On Tuesday, 3 November 1997 at around 3.00 am local time I received and recorded the "beeping" signal from the commemorative satellite launched from the MIR Space Station to commemorate the launching of the first "Sputnik" (satellite) 40 years ago.

The signal was received on a frequency of 145.825 MHz. The receiving equipment comprised a Yaesu Musen FT-212RH transceiver connected to two stacked four element vertically polarised Yagis at a height of 50 feet. The satellite pass was one predicted to be (based on orbital data for MIR) one of fairly high maximum elevation of 77 degrees.

I acquired signal almost as indicated by the predictions and also saw the loss of signal accordingly. The pass lasted for a total of approximately 10 minutes and seemed rather variable as if the satellite was tumbling at a slow rate with fade-outs from time to time. To have received these signals was for me quite a thrill.

My mind kept going back to 1957 when, with a government disposals AMR300 STC general coverage receiver, I listened to the very strong signals on a frequency of 20 MHz coming from the very first "Sputnik". My

antenna was a simple 40 metre wire dipole. I was located in the Melbourne suburb of Northcote in VK3.

My wife and neighbours came crowding into the radio shack to listen to this strange and seemingly "unearthly" noise. The volume on the receiver was turned up high and the sound "broadcast" down the street for others to hear.

At the same time as receiving those signals 40 years ago, it was possible to step outside and, in the night sky, observe the eerie sight of the satellite seemingly bobbing its way across the heavens (goodness knows we have seen many other satellites since then.)

Past Experiences

My mind also went back to one day at the Woomera Missile Range in the north of South Australia where, in control of an array of 16 stacked 16 element crossed Yagi antennas, I watched the signal strength display as the first, and only, satellite launched from Australian soil was "spun up" and placed into a polar orbit. This satellite was named WRESAT, having been built by the Weapons Research Establishment at Salisbury South Australia (an establishment which was part of the Defence Science and Technology Organisation).

The vehicle used to place the satellite into orbit utilised a Redstone missile as the main booster. Quite a few of these missiles were fired from Woomera as part of a re-entry physics research project known as Project Sparta. This was, of course, the type of missile used by the USA to place the first man into a sub-orbital flight.

My understanding is that the particular missile used for the WRESAT launch was regarded by the USA authorities as a "spare" which they kindly donated to WRE for this particular launch.

I was somewhat taken aback when I first saw one of these Redstones, particularly by the sight of what looked like large bicycle chains, which ran down the outside of the missile and were used to control the fins at the rear end of the missile for steering purposes.

The 16 Yagi array which I was operating for the WRESAT launch was originally from the Island Lagoon Satellite Tracking and Data Acquisition Network (STADAN) where I had been employed working for NASA on satellite tracking and telemetry work for a number of years.

Goodness knows just how many American satellites I had tracked using this very same array. A certain amount of the receiving equipment was also obtained from Island Lagoon, which station had been closed down following the establishment of new tracking stations in the Tidbinbilla location near Canberra, in the Australian Capital Territory.

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Features:

- Keypad frequency entry, 100 memories, selectable FM channel steps
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2m/70cm GST-1

Freq:	144-148MHz, 430-450MHz	Freq:	144-148MHz, 430-440MHz
Gain:	6dB on 2m, 8dB on 70cm	Gain:	7.9dB on 2m, 11.7dB on 70cm
Max. Power:	200W	Max. Power:	200W
Length:	2.7m	Length:	4.4m
Connector:	SO-239 socket	Connector:	SO-239 socket

D 4830

\$169

SAVE \$30

2m/70cm GST-3

Freq:	144-148MHz, 430-440MHz	Freq:	144-148MHz, 430-440MHz
Gain:	7.9dB on 2m, 11.7dB on 70cm	Gain:	7.9dB on 2m, 11.7dB on 70cm
Max. Power:	200W	Max. Power:	200W
Length:	2.7m	Length:	4.4m
Connector:	SO-239 socket	Connector:	SO-239 socket

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Revex W560N HF/VHF/UHF SWR/PWR Meter

Quality wide-band SWR meter, offering 2 sensors for 1.8MHz to 5.25MHz coverage! Provides monitoring of 3 power levels (3W, 20W, 200W) and SWR. Uses an N-type socket for the VHF/UHF sensor for minimal loss. Measures 120 x 80 x 85mm. D 3175



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2m 80W RF Power Amplifier

Designed for use with 2m FM handhelds, this solid 80W RF power amplifier really boosts your handheld signal at home or in the car. It works with RF levels of 0.5 to 5VA, provides 80W typical output with just 2.5W input, and just 1W input will still provide over 40W output. A 12dB gain GaAs FET receiver preamp can also be selected for improved performance in quiet RF areas. Frequency range 144-148MHz only. Requires 11.8V DC at 20A max. Size: 124x44x208mm (WHD) incl. protrusions. D 2520



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The Yaesu FT-50RD is an amazingly compact 2m/70cm Amateur band handheld transceiver which provides MIL-MIL-STD-810 shock and vibration resistance, super wideband receiver coverage, simple menu settings for most functions and compatibility with the optional Yaesu ADAMS software interface package for PC programming. Supplied with FN-40 slimline 6V 650mA/H NiCad battery pack, flexible 2m/70cm antenna and modified M-9626 AC plug pack adaptor for NiCad charging. Now includes new FTT-12 keypad for Digital Voice Recording, DTMF paging, CTCSS/DCS scanning and CTCSS encode/decode. D 3160



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So, at this early hour as I write this, I feel satisfied by my latest achievement which, to me, has more of a nostalgic and historical flavour than would be the case for many other people.

At the same time I contemplate the "march of science" and the various advances which have taken place in technology.

I do, however, wonder as to whether the world is really a better place for all this "progress". Alas, try as I may I will undoubtedly never be able to satisfactorily answer the question.

Well, I guess that is more often than not the case where nostalgia is concerned.

Just a Nostalgic Postscript

One other item which later came to mind was the receiving of signals from the first "OSCAR" satellite. In this particular instance I was able to use the same 16 crossed Yagis array. Whilst this array was designed to operate optimally in the 136 to 137 MHz satellite band it still showed reasonable gain and directivity at 144 MHz.

I used this antenna system in conjunction with a tuneable pre-amplifier using two 7077 ceramic triodes, which was located at the base of the antenna array. The signals were then piped down low loss feed cables and received on a Collins VHF Receiver, which I believe was a URR220 unit.

A recording of the received signal was made on 1/2 inch magnetic tape using an Ampex FR100B instrumentation recorder. I believe that I still have the original 15 inch reel of tape, still in its steel can, stored away in my backyard shed.

Another interesting episode was the reception, on HF, of voice signals from the manned Russian Vostok spacecraft. The speech signals received and recorded, also on the Ampex FR100B, were in the Russian language. A person who was skilled in that language was called in by the authorities to interpret what the cosmonauts said.

(At the Island Lagoon station we were never required to receive signals from the USA manned spacecraft. There was a tracking station at a place called "Redlake" on the northern side of Woomera which was part of the US Manned Space Network. They had there an FPS16 radar which was also used from time to time for tracking vehicles launched from the Woomera Range.)

The other Australian MSN tracking station was located in Western Australia at a place called Muchea.)

Reception of signals from the USSR Vostok spacecraft was by use of a Collins 237A Log Periodic Antenna which had the capability of operation from 10 to 30 MHz (a very large antenna where the supporting mast, around 300 millimetres [12 inches] in

diameter was enclosed within a tower section and the whole mast and antenna rotated). The longest element would have been nearly 15 metres (about 50 feet) long.

The receiver was another Collins unit, the R310A, which had a dial like an odometer on a motor vehicle. This receiver used a permeability tuning system where the "band" was set by positioning a large number of ferrite slugs within a set of coils. These were moved using a complicated system of gears and cams. There were 30 bands each of 1 MHz. The fine tuning across each band was achieved by a vernier system which then slowly adjusted the necessary coil slugs to cover the required range.

In the Service Manual for this receiver, which was a very comprehensive manual, there was an "exploded diagram" illustrating the gear-box and cam assembly. I distinctly remember someone at the station exclaiming with great vehemence on one occasion, "*I hope to goodness that it never explodes.*"

Final Comments

In the above notes I have made comment on trying to decide whether or not the world is a better place for the great developments in science and technology. I will leave it for you to try and answer that question for yourself.

In previous notes I have referred to the potential for amateur radio to contribute to better relationships between people on both a local and international basis. I do know that, if we are prepared to take the Spirit of Christmas which exists around this time of the year and allow that spirit to continue in all our dealings with others, we can make a most marked and meaningful contribution to society.

I bring to all my best wishes for a Blessed and Happy Christmas and the hope that the New Year will provide for you a time of happiness and satisfaction in all the worthy ways in which you desire. I also wish you good health as being one of the greatest blessings we can have.

VK6 Notes

Chris Lowe VK6BIK and

Chris Hill VK6KCH

With little time to prepare these notes prior to meeting the editorial deadline for the December issue, we will take the opportunity to introduce ourselves and provide a few personal details, along with a few general comments and VK6 information from both of us. In future you will hear from us alternately, as the task of writing the notes is to be shared.

Chris Lowe VK6BIK

My contact details are as follows: Chris Lowe VK6BIK; e-mail chrismor@avon.net.au; PO Box 838, Toodyay WA 6566; telephone 08 9574 4060 I also log in to VK6BBR (WIA packet BBS) when there is a "lift" on 2 metres! Since I work offshore on the Goodwin Alpha Platform off Dampier in the North West, I cannot always respond quickly to mail received. However, e-mail can usually be forwarded to me offshore the same day, by my better half at home. I am generally away on a two week or four week cycle, and therefore am home about 50% of the time.

Amateur radio interests include HF, VHF (FM & SSB), UHF (70 cm only at this stage), EasySats and MIR, packet, and subscription to various Internet e-mail "reflectors", as they are called by hams. Unfortunately (for me, but probably fortunately for the rest of you), I dwell in an RF hole in the bush, being located at the bottom of a river valley - the locals refer to us as "The Creek Dwellers"! That said, when there is a VHF "lift" on, and I am onshore, you will certainly hear me giving the Perth and other South West repeaters a bashing.

Chris Hill VK6KCH

Chris works in the radio-communications field, and is currently pursuing a Master of Telecommunications Engineering in his spare time. Main amateur interests include VHF and UHF repeaters, packet radio and both analogue and digital satellite work. Due to time constraints, he would prefer not to receive news articles by telephone, but rather by e-mail or packet radio.

Addresses: e-mail vk6kch@amsat.org; packet VK6KCH@VK6BBR.#PER.#WA.AUS.OC.

So, just as *Random Radiators* has "the two Rons", VK6 Notes now has "Chris and/or Chrs". We look forward to your input.

Now to a few general items that may be of interest.

WA Hamfest

The WA Hamfest, organised by the Northern Corridor Radio Group, was held at the Cyril Jackson Recreational Centre in Fisher Street, Bassendean, on Sunday, 2 November. This was the first time I (VK6BIK) have been able to attend this event, and my first impression at the car-park area was, "Wow, are there THAT many like-minded people in the State?" It was most reassuring. There can't be that many "Ham oddballs" at large amongst the "normal" population (can there?), so I came away feeling much better about what I get up to (or don't) in my time off from the drill rig.

The event itself appeared most successful, my fellow travellers from Toodyay telling me that there was a larger turnout than last year. Certainly, there wasn't much room to move in the main hall, and both the smaller and the

bigger vendors (who were well represented with support from the East) appeared to be doing a roaring trade. I know I came away with some brand new toys. Most pleasantly, I met many people that I have been talking to over the air, or heard of in other ways, in the flesh for the first time. The WIA crew, especially, were there in force!

Internet

I mentioned the Internet and e-mail reflectors. There has been a good explanation on how this works in the amateur press recently, and I can highly recommend, by way of making a start with this aspect of the hobby, interesting examples of each as follows (of course there are many more).

Internet site: URL is: <http://www.faroc.com.au/~vk6wia/> This is the VK6 Home Page.

VHF e-mail reflector: Send an e-mail message to majordomo@marconi.mpce.mq.edu.au with an empty subject line, and include in the text the statement "subscribe vhf-vhf". This will keep you up to date with the VK DX VHF scene, with many contributions and information from local VK6 amateurs.

VK6RAV Repeater

Hope everyone is aware by now that we have a "new" 2 metre repeater east of the Great Divide servicing the Avon Valley area. This repeater is VK6RAV (147.275 MHz receive, 147.875 MHz transmit) located at Crow's Nest to the north-east of Northam.

The footprint seems to stretch from just north of Bunbury in the south-west, to Cunderdin in the east, and to (at least) Calingiri in the north. Jim VK6CA is the repeater manager. There are excellent colour pics, etc under "Repeaters". VK6RAV, on the above-mentioned WIA VK6 Home Page on the Internet. Many thanks to the WA Repeater Group, and to Will VK6UU for the great photography, amongst other things. Note that the best way to help out the repeater group is with your membership!

WIA Meetings

WIA Meetings are held at the CWA building in Hay Street, West Perth.

The address is 1174 Hay Street West Perth, 3rd floor, CWA House. Meeting times are the third Tuesday of each month at 8 pm. For membership inquiries contact the *membership office* on 08 9341 3655. For general enquiries contact the *Secretary*, Christine VK6ZLZ, on 08 9351 8873, WIA, PO Box 10, West Perth WA 6872; or e-mail to vk6wia@faroc.com.au.

The December meeting on 9 December is to be/was in the form of a superb *a la Carte* Xmas Dinner in the dining room on the third floor of CWA House. Sure hope you were there!

The Broadcast Officer is Mal VK6TVA, 08 9429 1120; fax 08 9429 8859; e-mail vk6tva@omen.net.au

The Disposals Officer is Roy VK6XV, 08 9246 3642; e-mail rwatkins@faroc.com.au

Other Club Meetings

The VHF Group meets on the fourth Monday in the month at 2000 hours in the Wireless Hill museum meeting room.

The WARG (WA Repeater Group) meet on the first Monday in the month at 1930 hours in the Hillview Scout Hall, corner Welshpool Road and Gibb Street. The weekly on-air net is on Sundays at 10 30 am local on 146.750 MHz and the 29.120 MHz gateway

"QRN" News from the Tasmanian Division

Robin L Harwood VK7RH

It has become a tradition for branches to hold an informal get-together in December in lieu of the regular monthly meeting. For example, the North-western branch will be holding a Christmas Dinner at the "Bass and Flinders Motel" in Ulverstone on 9 December. The Southern Branch will probably be holding a BBQ at the Domain Activity Centre sometime during the month. Listen over VK7WI for details. There is nothing planned at this stage in the North, so I do recommend you listen out for details.

Divisional Council met in Launceston on November 22 but, as this is being written in early November, I naturally cannot report on what happened. Further details shall be in next month's column. However, we can confirm that the Divisional Annual General Meeting will be on 22 March 1998 at the northern campus of the University of Tasmania, at Newnham.

Our Divisional secretary, VK7BE, has been touring the outback during November. I would expect that we shall be hearing all about it at a future Branch meeting, complete with pictures. I believe that he has been checking in on the Travellers Net to let everybody know where he is.

The activity during JOTA 98 from the state was varied. Operations were based in scout camps or halls throughout Tasmania. The Northern Branch stepped in at very short notice when previous arrangements fell through. Stations were operational from Longford, Summerhill, Launceston (Kings Meadows) and Exeter. The North-western Branch also had activities at various locations, including a station in a scout hut on Cradle Mountain. I believe it did snow. Not to be outdone, some East Coast amateurs erected a station on Ben Lomond, which is in the North-east and 1500 metres up.

For the first time, the scouting organisation held Jamboree on the Internet (JOTI) in conjunction with JOTA. Some of us operating at Kings Meadows noticed the Pentium set up with modem all ready to go. I was expecting RFI from that yet, surprisingly, there was none. However, when we fired up on 40, guess what happened? The strong RF flooded the modem, instantly disconnecting the Internet connection. Immediately there were howls of protest and a compromise was quickly arrived at that we would take 45-minute turns. However, it was quite apparent that the Internet Relay Chat was more popular than talking over amateur radio. I think it is certainly an indication of how much the hobby has slipped in the public's perception.

The kids certainly do know all about the intricate working of the Net and the realisation that an amateur radio licence involved quite a bit of study and examination before a licence could be obtained, did not appeal to many kids. They can talk keyboard to keyboard now in real time with someone at the opposite end of the world without heavy QRN and poor propagation. They even can talk over the Net and exchange video, without a licence. However, the Internet is not free and it can get pretty expensive, depending upon the rates charged by the Internet Service Provider. Even an explanation of packet radio did not particularly excite them either. The speeds of an Internet connection and the graphics on the web appeal to them more than packet.

Where is our hobby going now? Perhaps even five years ago, amateur radio still appealed to kids, but the novelty has well and truly worn thin by now. Communicating via radio no longer attracts them.

As you are aware, the State Government is committed to the installation of online computers in every classroom. Kids are so used to using them and the increasing use of home computing means that our hobby is really declining. The membership in our Division has reduced over this past 12 months, as has the numbers of licensed amateurs. Activity on all bands within VK7 has also dropped away.

This means that the burden of maintaining repeaters and other services, is increasingly falling on to a diminishing membership base. Costs are rising sharply and branches and your Division will have to prioritise some functions. For example the Mount Barrow repeater on 147000 has been operating for 25 years. Recent introduction of site fees plus essential maintenance of the repeater antennas and equipment has meant that the Branch must seriously consider all options. Activity on the repeater has sharply declined

although it is probably still the best repeater servicing northern Tasmania.

This sounds very pessimistic I know. We can turn it around but it depends on YOU. If you care about our hobby and don't want it to become a historical footnote, giving our precious allocations up to commercial interests, who are only to eager to snap them up, then BECOME INVOLVED.

There was a group formed just a few months ago here in Launceston titled "Save Our State" which briefly blossomed and then faded as a result of the apathy and reluctance

to introduce change and reform into the political and economic agenda of Tasmania. We need to SAVE AMATEUR RADIO from apathy and reluctance to change. This needs to be at the branch, Divisional and, yes, even at the Federal level, if our hobby is to continue in the next ten years.

I will get off my soapbox now and all that remains is to extend the best wishes of the Divisional Council for the Festive Season to you and yours and hope 1998 will see a turnaround in the hobby.

■■■

As the solar Cycle 23 develops we can expect similar situations in the future.

This month is the last month of the year, and there are only a few more weeks to Christmas and a New Year. I wish all readers of this column a merry, festive Season and a prosperous and healthy New Year. See you all in 1998.

Many Young Ladies - RZ9MYL

It was almost a year ago when, listening around 20 metres late at night - 1100 UTC - that I came across the Russian station RZ9MYL in Omsk, Western Siberia. The operators were YLs and I listened to a number of QSOs in German, English and French I called in and had an interesting contact with the YL operator Nadia, who told me that she was operating from a Teachers College Club Station. The usual amateur information was exchanged and I sent my QSL card to the given address, hoping that one day a reply would come. Nothing happened.

In March this year I came across the same station again. The YL operator this time was Oksana. In response to my enquiry whether they received my QSL card for the earlier QSO, she called her supervisor, and Yuri UA9MAR came to the microphone. He greeted me like an old friend.

They had received my card for the earlier QSO and had sent me a reply card. When I told him that no card had arrived, he was embarrassed, said he was sorry, but there are sometimes problems with the mail system. He promised to try his luck again. A few months later a heavy cardboard envelope arrived from Yuri. A number of QSL cards, photographs and even a Club award arrived showing that I am No 1 VK for having had two QSOs with the station. There was also an interesting letter from Yuri. Here are some of the highlights.

Yuri UA9MAR has been on the air since 1967, and has been the Head of the "PULSAR" Radio Club attached to the Omsk Pedagogical University since 1992. He is now an Assistant Professor and is teaching his students the use of computers in their future professional activity. His wife, Valentina UA9MIL, is also at the College as a laboratory assistant and she takes part in the running of the radio club, being the Award Manager.

The Pedagogical University of Omsk is one of the largest in Siberia. There are 13 faculties. Future teachers of Physics, Mathematics, Russian Philology, Foreign Languages and other subjects study there. The largest faculty is the Faculty of Foreign Languages. About 800 students are studying German, English, French and Chinese. Ninety per cent of the foreign language students are women. The best students are

How's DX?

Stephen Pali VK2PS*



YL operator Nadia and supervisor Yuri UA9MAR at the console of Club Station Pulsar RZ9MYL in Omsk, Western Siberia.

Propagation is still a hot discussion topic among DXers. Solar flares and depressed conditions have played havoc with HF frequencies. Despite all this, there was reasonable propagation on 20 metres during the months of October and early November. The 10 cm flux was moving around the 85 average mark. On 5 November suddenly it shot up to 118 and the official report described the solar geophysical conditions as "moderate to high". It also said that a satellite proton event was in progress. This was the signal for a high intensity solar flare.

The "Sydney Morning Herald" quoted Dr Richard Thompson, solar scientist with the IFS Radio and Space Services as saying that the massive eruption on the sun at 10.49 pm local Sydney time on Thursday, 6 November

was one of the largest in at least 21 years. The explanation as to what are the consequences of such a massive energy eruption on the sun, were described thus:

- X-rays and extreme ultra-violet radiation travelling at the speed of light arrive in eight minutes, disrupting HF radio

- Protons and electrons arrive within hours, spiralling into Earth's magnetic field, often sending false commands to satellites and causing auroras.

- Slower-moving particles from the sun's atmosphere take up to four days to arrive.

- They "shake" our magnetic field, inducing electric currents that flow into power stations causing blackouts, corrosion in long-distance pipelines, HF radio distortions and auroras.

members of the University's Amateur Radio Club "Pulsar" and use the callsign RZ9MYL.

Before 1990 there were some Government grants to assist the best students with overseas study trips but now, because of the difficult economic times, these students use amateur radio to practice their language skills.

The Club operates a Yaesu FT-747GX transceiver (donated by DJ1KM), a home-built 200 watt linear amplifier, a four element cubical quad antenna for 20, 15 and 10 metres, a two element sloper for 40 metres and a 160 metre long loop antenna for 160 and 80 metres.

In Russia everybody may use the facilities of an amateur radio club, including transmitting with the club callsign, but the activity has to be supervised by the amateur chief-operator. More than 70 girls from the Foreign Languages Faculty use the club callsign. Most of them are not interested in amateur radio as such, not even in equipment or DXing, but only in talking to people in other lands to practice their language skills.

For this reason RZ9MYL is on the air constantly. However, overcrowding and shortage of equipment gives the students only 1-2 hours per week on the air. Expansion is necessary. They have obtained a room in a students hostel for the second station but they have no equipment. To assist them to furnish this second station every bit of help is welcome.

RZ9MYL is on the air every day near 14120 or 14330 kHz from 0700 to 1500 UTC. "Please call us" says Yuri.

Yuri is on the Internet. His e-mail address is ua9mar@pulsar.omsk.su. His postal address is: Yuri Polushkin, President of CSC "Pulsar" Radioclub, PO Box 1742, Omsk, 644000, Russia.

Chasing IOTA Islands

David Rankin VK3QV, well known in IARU Region 3 circles, who lives in Singapore and is active as 9VIRH, was kind enough to supply me with nine addresses of Indonesian amateurs who reside on relatively small island groups.

For those who are IOTA Island chasers, here is the information which might be useful to you.

* OC-022 Bali Island Alt YB9AS. PO Box 3594, Denpasar, Bali Island, 80001 Indonesia

* Kadek Kariana SP YC9BU, PO Box 106, Singaraja, Bali Island, 81100 Indonesia

* OC-088 Indonesian Kalimantan. Jar YC7JKS, PO Box 15, Banjarmasin City, CP 70001 Indonesia

* OC-146 Sulawesi Island. Ricky E J Welan YC8UYB, PO Box 1423, Manado, 95014 Indonesia



Members of the Radio Club Pulsar. Yuri UA9MAR and his XYL Valentina UA9MIL are sitting in the middle of the front row.

* OC-147 Iran Jaya's Coastal Islands. Jerry Katuk UC8BJK/9, PO Box 623, Biak Island, 98115A Indonesia.

* OC-148 Timor Island. Ferdinand Konay YC9MKF, Inanus Rohi YC9NBR. Address for both: PO Box 1021, Kupang 85000 Indonesia.

* OC-209 Talaud Island. Jusuf Maringka YC8TZR, PO Box 205, Lirung, 95871 Indonesia.

* OC-210 Sangihe Island. Ronny Monoarfa YC8TXW, PO Box 166, Tahuna, 95800 Indonesia.

Please note that the YC callsign indicates a novice amateur status, and 15 metres is the band where they can be found.

Some of these island groups are so isolated that mail comes only once a week. Sometimes it can take quite a while for a QSL to arrive. Patience is needed. David is active on 15 metres and his postal address is: David Rankin, PO Box 14, Pasir Panjang, Singapore 911121.

Amateur Stations in Uganda - 5X

Peter ON6TT, who is the Chairman of the Uganda Amateur Radio Society, has issued an information leaflet about the state of amateur radio in this landlocked country in East Central Africa. There are 34 licensed amateurs in Uganda (the 1997 edition of the International Callbook shows only seven entries), of which some are no longer in the country and a lot are not very interested in DX.

Uganda has a working QSL Bureau to receive cards, but there is no funding for

sending cards out of the Bureau. This is the reason why most of the DX-minded amateurs use a QSL manager. The most active Ugandan amateurs at the moment are: 5X1C, Mario, via WA1ECA; 5X1P, Joe, via G3MRC; 5X1Z, Mats, via SM7PKK; 5X1T, Peter, via ON5NT; and 5X4F, Paul, via K3SW. Mats and Joe work almost exclusively CW, Paul mixed modes and Peter almost exclusively on RTTY and SSB.

The team at work will shortly be joined by DJ1US, but Stephan does not have a 5X licence yet. The following are no longer active, having ended their contracts a while ago: 5X1R, Ake; 5X1D, Ghus (Ragge); and 5X1N, Janne. Jeff 5X1WJ is temporarily not active.

It has been noted that all these amateurs are not local residents. All of them work either for the International Red Cross, other relief agencies, or for other UN sponsored aid programs.

Future DX Activity

* Jacques F6HMJ will be on all bands from Mauritius as 3B8/F6HMJ from 26 November until 12 December

* Mats SM7PKK is in Uganda signing 5X1Z and was heard on 1833 kHz around 2100-2200 UTC

* Ron FP5EK is now active from St Pierre and Miquelon Islands QSL via KIRH.

* The planned Belize activity by a group of USA amateurs (WS), to take place at the beginning of November, was cancelled.

* Paul KF4OOX is now on Ascension Island as ZD8V He is on the island on a long term assignment QSL direct via Paul L

Hutley, CSR 6310, Ascension, PO Box 4915, Patrick AFB, FL 32925, USA. Paul mentions that Dave AC4IV is also active on the island as ZD8T.

* Dan LZ2UU will visit the Bulgarian Antarctic Base "St Kliment Ohridski" on Livingston Island in the South Shetland Group, using the callsign LZ0A.

* 5V7BC is active from Togo QSL via F5KPG

* Charles (ex-S92SS) and his XYL Leslie (ex-S92YL) will be active for the next four years as SV0KM and SV0LN from Northern Greece. QSL via PO Box 1001 (KAV), GR-67100, Xanthi, Greece.

* Paul PA3DZM is now active from Burundi as 9U2L. QSL via PA3DMH.

* Dias D2AI is active on all bands from Angola. QSL via CT1EGH.

* Do you need Guatemala as a new DXCC Country? A group of Finnish operators will be active from there next year from 18 January to 5 February. Details later.

* Joe K3KN, who was active from Liberia as EL/K3KN, now has the callsign EL2JR. QSL via KB3U.

* RIANF is a Russian Club station at Bellinghausen Base on King George Island. QSL via DL5EVE.

Interesting QSOs and QSL Information

* 4U1WB - 14213 - SSB - 1322 - Sep. QSL via KK4HD, Paul J C Van Der Eijk, 4900 Bradford Drive, Annandale, VA-22003, USA.

* OY3JE - Jan - 14220 - SSB - 1310 - Sep. QSL via Jan Egholm, Box 3033, FR-110, Torshavn - Faroe Islands.

* VP2MGG - Graham - 14222 - SSB - 0552 - Sep. QSL via WB2YQH. Robert E Nadojny, PO Box 73, Spring Brook, NY-14140, USA.

* OA4CPI - Gian - 14250 - SSB - 0529 - Sep. QSL via the QSL Bureau or direct via Giannandrea Mangia Vacchi, PO Box 538, Lima 100 Peru, South America.

* T88AA - Toshi - 14036 - CW - 1256 - Sep. QSL via JI1CEL. Toshiyasu Arai, I-26-8-304, Shinsei, Kumamoto 862 Japan.

* V63DX - 7011 - CW - 1058 - Sep. QSL via KA7HMZ. Shoji Igawa, Yokobon, Ogachi, Akita, 019-02, Japan

* BX0YL - 14193 - SSB 1231 - Sep. QSL via BV4YB Fengyuan Group Station, Box 163, Fengyuan, Taichung, Taiwan.

* TA2LZ Deniz 14243 SSB 0644 Sep. QSL via TA2IR. M Riza Gulen, PO Box 195, TR-81302, Kadikoy, Istanbul, Turkey.

* K7K 14023 - CW 0809 Sep. QSL via KE7LZ, Robert W Johnson, 5627 W Hearn Rd, Glendale, AZ-85306, USA.

* 3Z0ZAM - Marian - 14032 - CW - 1428 - Oct QSL via SP8LZC, Marian

Cinkiewicz, ul Hrubieszowska 67 m 9, 22-400 Zamosc, Poland; or via the Bureau via SP8LZC.

* 4L0CR - 14215 SSB 1312 Oct. QSL via IK7JTF, Salvatore Borace, 3 Trav Corso Roma NC, I-70010, Cellamare, BA, Italy.

* TR8SA - Chris - 14192 - SSB - 0600 - Oct. QSL via F6FNU, Antoine Baldeck, PO Box 14, F-91291, Arpajon, Cedex, France.

From Here There and Everywhere

* Robin DU9RG was active with the special prefix 4I9RG during November, celebrating the 65th anniversary of the Philippine Amateur Radio Association (PARA). QSL via DU9RG.

* Klaus DJ9DX and Theo DJ1RL were active from Madagascar, then at the end of November from Mayotte signing FH/home call. QSL is acceptable via the German QSL Bureau.

* The Administration on Nevis Island (V4) in the Caribbean has decided to secede from its Federation with St Kitts (V4) which was formed after the countries obtained their independence in 1983. A two-thirds majority vote by the islands 5000 voters will decide whether they will become fully independent. The possibility of a new DXCC country is on the horizon.

* It was rumoured that Pitcairn Island amateurs might be using VP6 in their callsigns as the VR6 prefix belongs to the Peoples Republic of China since the hand over of Hong Kong (VR2).

* If you worked the special prefix station OFOTA from Aland Island during the CQ WW SSB contest, it was Pekka OH2TA celebrating the 80th anniversary of the independence of Finland. QSL via OH2TA.

* Jim VK9NS was active as VU2JBS on the low end of the CW section of the 20 metre band.

* Yoshihiko JA2MN B was heard on the east coast of Australia on CW in the 20 metre band, operating as 3W5MN B from Vietnam. QSL to home call, JA2MN B, Yoshihiko Hirano, PO Box 6, Nishiharu 481.

* Rick (formerly KH6EB) a well known DXer in the Pacific, has changed his callsign to KH7RS.

* Tariq AP2TJ reported a lot of pirates using the AP prefix operating CW on a variety of bands. The only bona-fide CW operators at present in Pakistan are: AP2HA (Hasnat, active mostly on weekends); AP2MY (Yunus, presently QRT); AP2SD (Shahid, presently QRT); AP2NK (Nasir, occasionally active); and AP2TJ (Tariq, occasionally active). Tariq says that foreigners will not be given amateur licences in Pakistan.

* Andy 9X0A now has a QSL manager in Germany. He is Gottfried Gerth DL5WM, Obere Dorfstr 13a, D-09661, Grünlichtenberg, Germany.

* There is a lot of confusion with the QSL route for the *0ANARE suffix. The VI0ANARE call is used only by a small group of VK4 amateurs celebrating the 50th anniversary of the establishment of the Australian National Antarctic Research Expedition activity. QSL manager is Alan VK4AAR.

* Tom VK0TS on Macquarie Island used the VK0ANARE callsign from 25 to 31 October. The QSL route is the same as for VK0TS, viz: Simon Trotter VK1AUS, PO Box 2063, Kambah Village, ACT 2902.

* The ZM7A/ZL7AA team was very active from Chatham Island from 22-27 October. QSL via Lee Jennings ZL2AL, PO Box 54, Hastings, 4201, New Zealand, or via ZL2AL via the Bureau.

* The ZK1XXP team on North Cook made 15,299 contacts comprising 6,708 SSB, 8,101 CW and 490 RTTY contacts.

* On the occasion of the 1997 World Radiocommunication Conference WRC-97 the special call 4U1WRC was activated from 20 October to 21 November. QSL via 4U1ITU, IARC, PO Box 6, CH-1211, Geneva 20, Switzerland.

* The Iranian QSL Bureau is located at: Director General of Telecommunications, Ministry of PTT, Dr Sharati Ave, PO Box 11365-931, 16314 Iran.

* T32RT is Ramate Tekeaki, London Village, Christmas Island, Republic of Kiribati, Central Pacific.

* Ray 5R8FK says that there are mail problems in Madagascar, therefore all cards should be sent to his home call, NY3N.

* The ARRL has announced that the US has applied to the European Conference of Postal and Telecommunications Administration (CEPT) to participate in that system. If successful, the temporary activity of US amateurs in Europe and European amateurs in the US, will solve the problem of reciprocal licences.

* Some operators are still confused how to QSL with the Libyan club station 5A1A. Abubaker (Sep 97 *Amateur Radio*) provides this information: send your QSL card only by registered mail to PO Box 74421, Tripoli, Libya. This is in your interest because there is a heavy "QRM" regarding overseas mail delivery. DO not send ICRs because they are not valid in Libya. Send two "green stamps". Abubaker says that he can confirm every contact with 5A1A including those made by the other operators or DXpeditions who used the call 5A1A, except the Austrian activity with the call 5A28 and (presumably) the

German activity from 24 November until 4 December which has DL3KDV as QSL manager.

* The proposed St Pauls Island activity using the call CY9DX was cancelled.

* Chuck N4BQW/KH5 was active from Palmyra from 17 to 25 October. His proposed Kingman Reef activity was cancelled due to lack of time to enable him to catch the weekly plane out from Christmas Island T32.

* A number of new callsigns are appearing in Antarctica. ZL3PX was heard at 0800 UTC on 14245 kHz. QSL via ZL3PX. VU2JBK was also heard at 1800 UTC. Oleg UR8LV will be joining the third Ukrainian Antarctic Expedition at Vernadskogo Base (VP8).

* George, who was operating as 5B4/G3LNS from Cyprus, now has the callsign 5B4AGC. QSL via PO Box 1344, Paphos, CY-8133, Cyprus.

* QSL for the VK9LX Lord Howe activity goes via VK2ICV, Nick Hacke, PO Box 730, Parramatta, NSW 2124.

* SONRA, the Society of Newfoundland

Radio Amateurs, operates the special call VO500JC, from the Club Station VO1AA in Cabot Tower in St John's, daily until 31 December 1997, celebrating the 500th anniversary of Cabot's voyage to the New World. Favourite frequencies are 14030 CW, 7030 CW and 14300 kHz SSB. Please QSL via the bureau or direct to VO1AA.

* YIIRS is an Iraqi club station with a variety of operators. Just recently WB3CQN offered to be a QSL manager for the club and his offer was accepted.

* Marcel FW5XX who, during his stay, gave a "rare country" to many amateurs, left Wallis Island on 17 November and returned to Belgium.

* Ron ZL1AMO was active during early November both on SSB and CW from Rotuma Island as 3D2RW/Rotuma.

* The other night, among the "chit-chat" nets on 40 and 80 metres, there was some discussion on the merits and demerits of the daylight saving scheme, which introduced five different time zones on our continent. Some of the participants were totally

confused about the correct time in various capital cities. Here is a simple answer. When it is 12 noon in NSW, Tasmania, Australian Capital Territory and Victoria, it is 11:30 am in South Australia, 11:00 am in Queensland, 10:30 am in the Northern Territory and 9:00 am in Western Australia. Daylight saving began on the last Sunday in October and ends on the last Sunday in March next year.

QSL Received

ZB2AZ (6 w - GARS [Gibraltar Amateur Radio Society]), R1MVI (4 m - OH5NE); HV4NAC (9 m - IK0FVC); JY9QJ (4 w - DL5MBY); 9G5CW (5 m - DL2RUM); and TT8JFC (1 m - W4JZB).

Thank You

The number of fellow amateurs who assist me to compile these notes varies from month to month. However, there is a core of the faithful to whom I must say a special thank you: VK2XH, VK2KFU, VK2TJF, ON6TT, UA9MAR, 9V1RH, and the publications QRZ DX, The DX News Sheet, The DX News Magazine and 425 DX News.

*PO Box 93, Dural NSW 2158

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Education Notes

Brenda M Edmonds VK3KT* Federal Education Coordinator

This is the first chance I have had to report on my trip to the IARU Region III Conference in Beijing in September. There was a brief report in WIA News in November Amateur Radio which most of you will have read, but there were several matters relating to education and the future of the Amateur Service which I found very interesting. One such topic was the ARDF activities. I am becoming more convinced that this would be an ideal way to start getting amateur radio into schools.

Since I returned I have tried to check changes in membership numbers of the different countries, but the various Society reports do not always specify numbers, or whether figures given are for the number of operators in the country or the number of Society members. I can state, though, that amateur radio is growing rapidly in Hong Kong, Korea, China, Bangladesh and Thailand. In many of these countries the main increase is in VHF usage, and few operators are licensed for HF. In some areas, there may be many licensed operators, but the only transmitters are club stations. On the other hand, numbers are dropping in Japan as well as in Australia. The outcome of a WIA paper on decreasing recruitment is that I have been asked to find out whether other Region III countries see this as a problem.

At the same time, I will be in touch with other societies about the development of a harmonised examination syllabus for ease of recognition of qualifications throughout Region III.

An information paper on ICARE, which was new to most of the attendees, was well received. I will be preparing a further paper for publication in the Region III News.

An important part of any Conference is the interaction between attendees outside the formal program. It was very pleasing to renew acquaintance with many of those I met in Singapore, and disappointing that some who I had expected to see did not attend. The formal receptions hosted by the Region, JARL and the host society CRSA were most enjoyable, and an ideal time to meet informally with visitors from other countries.

The formal Conference program ran for four days (8 - 12 September), with much of that time spent in working groups discussing the many papers circulated before the meeting (11 September was left free so that we could all enjoy some sightseeing - specifically a bus trip to the Great Wall. No, I will not bore you with my photographs). The meeting concluded on the afternoon of 12 September with the final Plenary Session and various presentations. A number of individuals and societies honoured David

Rankin 9V1RH/VK3QV, with speeches and gifts on his retirement as a Director of Region III.

Congratulations are due to CRSA on the efficient organisation and management of the whole week. In particular, the group of University students who acted as "liaison" were most helpful and attentive to our needs.

Personally, I found it a challenging and rewarding experience. I am glad now that I let the family persuade me to stay a few more days afterwards to see something of Beijing. For those of you concerned about WIA finances, I paid my own way, but I am sure now that it was money well spent.

*PO Box 445, Blackburn VIC 3130

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**Remember to
leave a three
second break
between overs
when using a
repeater**

Novice Notes

Peter Parker VK1PK*

Antennas for the Space-Restricted (Part Two)

A Magnetic Loop for HF

Introduction

October's column looked at compact antennas that amateurs use to operate from confined locations. The smallest antenna described for 80 metres was a magnetic loop. This month, we provide all the details needed to build your own.

Description

Able to cover all frequencies between 3.5 and about 10 MHz, the loop described here is directional, does not require a radial system, and stands just 1.8 metres tall. Most parts needed can be purchased at a hardware shop. The antenna can be put together in an afternoon and requires only hand tools to assemble. It should cost less than sixty dollars to build.

Figure 1 is the schematic diagram for the loop. Note that the element is continuous except for a gap at the top across which the variable capacitor is wired. The feedline is connected to the bottom of the loop.

Figure 2 shows the physical construction of the antenna. The loop element is 1.5 metres square and is supported on a wooden cross. To minimise losses, thick aluminium strip is used for the element. At the top of the loop is a high-voltage variable capacitor. This is used for adjusting the antenna to the operating frequency. Because of its narrow bandwidth, the tuning is very sharp and a vernier drive has been added to make tuning easier. Dimensions are not particularly critical, provided it is possible to bring the loop to resonance on all operating frequencies with the variable capacitor used.

Parts Needed

The following materials are required to build the antenna:

3 x 2 m lengths of 3x20 mm aluminium strip

1 x 1.8 m length of 20x44 mm pine

1 x 1.5 m length of square (12x12 mm) wood

1 x polyethylene chopping board (medium or large size)

1 x 150x80x4 mm piece of stiff high-voltage insulating material (eg Bakelite)

2 x right angle metal brackets

1 x 20-400 pF high voltage variable capacitor

1 x 6:1 vernier reduction drive (Dick Smith No P-7170)

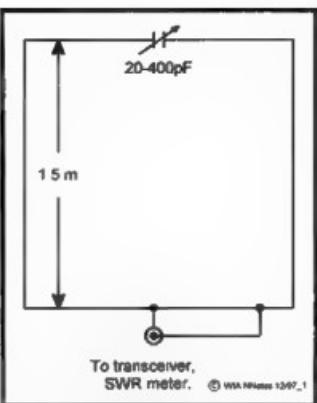


Fig 1 - Schematic Diagram of the Magnetic Loop

Small length of coaxial cable braid; RG58 coaxial cable (any length) and PL259 plug; screws, nuts and miscellaneous hardware.

Many of the above items can be bought at hardware shops. The main exception is the wide-spaced variable capacitor. These are almost unobtainable commercially, though you could try Daycom in Melbourne. Other possible sources include old high power transmitting equipment, Hamfests and deceased estates. The exact value of the variable capacitor is not particularly important, provided it is at least about 400 pF. The capacitor used in the prototype was a two gang 200 pF unit with 2 mm spacing between the plates. The gangs were connected together to provide the needed maximum capacitance.

If your attempts to obtain a suitable capacitor fail, there is always the possibility of making one. Full construction details appear in DK1NB's magnetic loop design program (details later).

Construction

The first step in assembling the loop is to make the wooden cross that supports the aluminium element. This is done by bolting a 1.5 m horizontal cross piece to the 1.8 m vertical section. A white polyethylene chopping board is used for the antenna's base. The two right-angled brackets are used to attach this to the vertical section.

The next step is to bend the three lengths of aluminium so that they form a 1.5 metre square loop able to fit on the frame when bolted together. As is visible in Figure 2, two

pieces are "L" shaped, while the other is bent into a shallow "U". Note that the two L-shaped pieces are about 10 cm apart at the top of the loop. These are physically joined by the bakelite insulation block that is attached to the top of the length of pine. The upper L-shaped pieces meet with the lower U-shaped piece at points 'v' and 'w'. The overlap is about 40-50 millimetres. Make the electrical connection at these points as good as possible. To achieve this, sand the aluminium at the point of contact and use two or more small bolts to hold the pieces together. Use special conductive paste if available.

The variable capacitor is mounted on a home made metal bracket so that its shaft faces downwards (see photo). To the shaft is attached a vernier reduction drive. Use either small brackets, fishing line or glue to fasten the frame of the reduction drive to the 1.8 metre vertical section. Note the thick, low-resistance conductors between the end of the loop and the tuning capacitors. Braid from a length of coaxial cable was used in the prototype. Make these connections short to minimise losses.

The loop is fed at the bottom. The braid of the feedline connects to the centre of the lower horizontal element (Figure 2, point 'x'). The inner conductor connects to the loop at point 'y' via a 900 mm length of coaxial cable (inner and braid soldered together). At both 'x' and 'y', a small bolt, nut and eye terminal connector are used to make connections to the aluminium element. The distance between 'x' and 'y', and the length of the coaxial cable, may both have to be varied for proper matching – this is discussed later.

Adjustment

The object of the adjustment process is to adjust the section between 'x' and 'y' until the antenna's feed-point impedance can be made to equal 50 ohms on the bands of interest.

The first step is to connect the antenna to an HF receiver tuned to 7 MHz. Set the receiver's RF and AGC gain controls to near maximum and the antenna's capacitor to minimum capacitance (plates fully unmeshed). Then gradually increase the capacitance. Not much will happen at first, but the noise from the receiver should gradually start to increase. Further adjustment of the capacitor will result in the received noise falling. Turn the capacitor back to the position where the noise peaks. Depending on the value of your capacitor, the plates should be around a quarter meshed at this point. This test confirms that the antenna can be tuned to 7 MHz.

Repeat the process for 80 metres. This time, the noise should peak when the capacitor is near maximum capacity. If it is

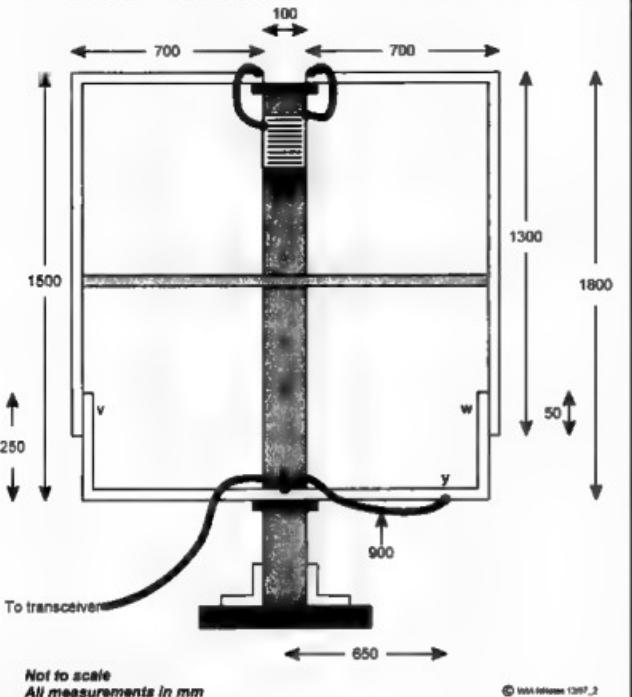


Fig 2 - Magnetic Loop - drawing

not possible to obtain a peak, try setting the receiver to a higher frequency (4 or 5 MHz) and tune for a peak. If a peak is obtained there, but not on 3.5 MHz, it is likely that the variable capacitor's maximum capacitance is too low for eighty metres. Possible remedies include substituting a larger capacitor, connecting high voltage fixed capacitors in parallel with the variable capacitor, or making the loop larger.

Having confirmed that noise peaks can be obtained on all frequencies of interest, it is now time to ensure that the antenna's impedance is 50 ohms at these frequencies. This entails making adjustment to the antenna's feed point.

The use of a resistive antenna bridge¹ is recommended so that you can make antenna measurements without radiating a signal. If all you have is a conventional SWR bridge, make adjustments during the day to minimise the risk of interference to other stations.

Position the antenna near its final operating position (which should be out of other people's reach). Set your transceiver to about 3.580 MHz. Adjust the variable capacitor for maximum received noise.

Transmit a steady carrier and note the reflected power or SWR. Adjust the transmitter up and down 40 or 50 kilohertz to find the precise frequency where the SWR is lowest. Note the reading at this frequency. If you are lucky, the reflected power should be nearly zero. Otherwise, adjust the length and position of the 900 mm lead joining the feedline to point 'y' and/or the spacing between points 'x' and 'y'. You will find that there is some interaction between these adjustments and the setting of the variable capacitor. Every time a change has been made, adjust either the transmitting frequency or the antenna's variable capacitor for the point where reflected power is lowest. Repeat these procedures until reflected power is either zero or close to it.

When making these adjustments, there is a temptation to leave the transmitter keyed while making changes to the antenna or adjusting the variable capacitor. This should not be done for two reasons. The first is that the voltages at the top of the antenna element can be quite high (hundreds or even thousands of volts) even with quite low transmitting powers. The second is that the

loop is detuned when people are near it. Thus, any adjustment made when you are near the loop will not be optimum when you move away. This effect is particularly pronounced on higher frequencies, and applies to metal objects as well as humans.

Once a length and position for the 900 mm coaxial cable has been found², along with an appropriate spacing between 'x' and 'y', all further adjustments can be done with the antenna's variable capacitor. Operating the antenna is described in the next section.

Operation

The Q of this antenna is very high. This means that it can only operate efficiently over a narrow frequency range (5-10 kHz typical). Almost every time you change frequency, you will have to change the setting of the variable capacitor.

As mentioned before, this is done by peaking the capacitor for maximum received noise at the desired operating frequency. If the reflected power is high, make further adjustments until it is acceptable. Again the use of a resistive-type bridge (rather than a conventional SWR meter) is preferred because of the ability to tune up without causing interference.

Note that the loop is directional, with a sharp null when the element is facing the direction of the incoming signal. This makes its behaviour different from that of full-sized quad elements, where the null is off the sides of the loop. This directivity can be useful when nulling out interference. It is also useful to remember that, when other stations report difficulty in hearing you, turning the loop may improve your signal.

Results

This loop has been used extensively on eighty metres. Most contacts have been made with the antenna indoors. Though performance is well down on a dipole, contacts into Western Australia and New Zealand have been made with it. The power used was twenty watts. Lower powers have been tried, but results have not been good.

Contests are always good events to test the effectiveness of new antennas. During July's four-long 3.5 MHz Australasian CW Sprint, twelve contacts were made with the loop. This was despite the added handicap of having to retune the antenna with every significant frequency shift.

As would be expected, the loop's disadvantage when compared to full-sized antennas falls with increasing frequency. On 7 MHz for instance, the theoretical difference between the loop and a half-wave dipole is barely one S-point. Tests have confirmed the effectiveness of the loop on 40 metres, though all contacts have so far been within VK/ZL.

Improving the Loop's Efficiency

The antenna described is capable of good results on 80, 40 and probably 30 metres¹. However, it is a compromise, designed for low cost and easy construction with basic tools. Doing any of the following will increase its efficiency and/or usefulness:

1. Use copper rather than aluminium. Copper is more conductive (but more expensive) than aluminium. This means that a version of this antenna using copper rather than the specified aluminium is likely to be more efficient than the prototype. Copper water pipe (the thicker the better) should be suitable.

2. Soldering the loop element directly to the variable capacitor will also improve performance and long-term reliability, especially if the antenna is used outdoors. The reason why this wasn't done in the prototype was due to the difficulty in soldering to aluminium.

3. Use a single piece of metal for the conductor to reduce resistive losses. Where this is not possible, either solder/weld pieces together, or use conductive paste to minimise losses.

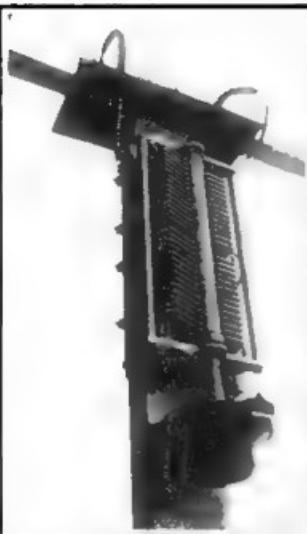
4. Make the loop a circle or octagon instead of a square. Square loops are the easiest to make, but cover less area for a given perimeter than other shapes. Thus lowers efficiency.

5. Make the antenna rotatable. The loop's deep nulls can be used to advantage in nulling out interference from power lines, TV sets and other stations.

6. Use a larger loop. Efficiency increases rapidly with loop size. Even a 2 or 2.5 metre square loop should be noticeably more efficient than the 1.5 metre antenna presented here. The use of magnetic loop simulation software (see elsewhere) allows one to estimate the improvement possible by making this and other changes suggested above.

7. Use more reduction on the variable capacitor to make adjustment easier. The first prototype (as shown in the photo) had only one vernier drive on the capacitor's shaft. With this arrangement, getting the antenna tuned to the desired frequency was tedious because the tuning is sharp. If you routinely change frequency, a second drive is well worth the cost, particularly if 40 and 30 metres are the main bands of interest.

To perform this modification, install the two vernier drives in tandem. If the front drive contains a 0-100 dial, you may find that the knob is limited to three turns and the back part restricted to 180 degree rotation. To overcome this, remove the knob, unscrew the 0-100 dial, and remove the C-shaped bracket that is restricting movement.



Close-up of tuning capacitor. Note that the Bakelite insulating block, the coax braid connections to the variable capacitor and part of the aluminium element are all visible in the photo.

Information About Magnetic Loops

All information used in the construction of the prototype came from the following Internet sites:
<http://ourworld.compuserve.com/homepage/s/csl/magloop.htm>
<http://www.gqpcclub.demon.co.uk/ants.htm>
<http://www.cdrom.com/simtel.net/msdos/hamradio.html>

Hans Joachim Kramer, DK1NB has developed a DOS computer program useful for those who design magnetic loops. Able to calculate efficiencies and bandwidths, this freeware program also contains much useful constructional advice (including pictures) to assist those who experiment with magnetic loops. This excellent program (mloop31.zip) is available from the last mentioned site on the list above.

Notes

¹See Demaw/Hayward, *Solid State Design for the Radio Amateur*, ARRL, 1986, page 167.

Once made, this adjustment should be close to optimum on all bands covered by the antenna; no further adjustment should be necessary.

The antenna has not yet been used on 30 metres. However, gain should be within a few decibels of a half-wave dipole.

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ME

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

Gordon Loveday VK4KAL *

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Coordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (the "Australian Communications Authority" in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

Interference on 20 m

The World Service from the BBC has been heard on 14.220 MHz from 2230z until about 2345z. It appears to be the second harmonic of their 7.110 MHz transmission.

I was advised by Dave Thorne, station manager of the ACA in Hobart, that this frequency is now clear, as at 29 October A check at my QTH (using a 15 valve GEC receiver) on 30 October showed only a very weak transmission on 7.110 MHz.

*Federal Intruder Watch Co-ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-I Tel 07 4985 4168.

Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Contest Comments

I read with interest VK3AFW's suggestions in relation to the VHF-UHF Field Day Contest and offer my comments from the viewpoint of a 6 m DXer. I agree the rules should be consistent from one year to the next for any contest. 50 MHz was not included in 1997 because there were too many complaints arising from poor 1996 contest operating practices exhibiting a total disregard for band plans and peaceful co-existence.

The 1996 rules were quite clear and from the November 1995 issue of *Amateur Radio* I quote: "All modes and bands above 30 MHz may be used. Contest exchanges should not be made on recognised DX calling frequencies." So, what do you think happened? Incessant and irritating "CQ Contest" all day long on 50.110 MHz, that's what!

The 10 kHz guard band VK3AFW suggests around 50.110 MHz is insufficient and, in essence, some of the 6 m rules have already been defined by FTAC as published in the November "FTAC Notes" and 1998 *Call Book*. I quote in part: "All other operation should be above 50.150 MHz, with a new Australian calling frequency on 50.200 MHz."

I doubt Mr Cook's suggestion of "self policing" will work because history has shown us it hasn't before, which brings me to my next point. Why bother having rules in the first place if they are not being enforced? There are numerous stations I could name that were heard calling on a "recognised DX Call channel" and were in the final list of results. In theory these stations should have been disqualified. No one wants to play "policeman" but somebody is going to have to as the self policing by participants cannot always be relied upon.

It is laughable to think that a Yagi, particularly a home-brew one with varying degrees of tolerance, will not perform satisfactorily any more than 40 kHz up. I would hate to think how such an antenna would perform when it rains or even when it's subjected to nearby ground effect variance when it's rotated. Even an M2 2.5 WL Yagi has a usable bandwidth of 800 kHz according to the manufacturers specifications. This is definitely not a valid excuse to huddle close to 50.110 MHz.

One concern also arises and that is promoting 6 m contest operation during times of intense Es propagation increases the

likelihood of causing harmful interference to Channel 0 Television services. The acquisition of 50.050–50.200 was originally granted on a strictly non-interference basis, and remains the case today even with our revised allocation.

If we must suffer contesting on 50 MHz then please keep it strictly above 50.150 and I would suggest the following changes to the rules be implemented without further hesitation:

General Rules:

"All modes and bands above 50.150 MHz may be used. Contest exchanges on recognised DX calling frequencies are not allowed."

In addition to this I would also like to see the following category added:

Disqualification:

"Any station(s) found not abiding to rules of the contest shall be subject to disqualification from the contest."

I would be extremely unhappy to miss out on a DX contact that might get buried underneath a 5x9+ VK collecting numbers. This is especially so as we approach the next solar peak, whereby the instances of long haul propagation (even coming in on an Es extension) will increase. In the first weeks of January in previous years the following countries have been worked from VK3 alone: W, XE, OH, JA, SM, LA, P29, T12 and KH6 to name a few. You would not even hear the very weak EU's underneath a contest.

To close I must sadly report that it's been almost two years on and I still haven't had the courtesy of a reply from the VHF-UHF Contest Manager, despite requesting a response. My concerns listed above were conveyed to him and I believe are still as valid today as they were then.

Adam Maurer VK3ALM
UKSMG Country Manager
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Dandenong North VIC 3175

Federal President Replies to Federal Finances, Federal Problems

Issues and criticism raised in *OTY* letters from Peter Williams VK3IZ, Peter Parker VK1PK and Chris Lowe VK6BIK should not go unanswered.

Losses sustained by the WIA Federal company operations are indeed a problem. Income and expenditure have been issues addressed at length at Federal Council meetings and discussed frequently by the board of directors.

The fall in membership is highlighted by both Peters. The decline in Division membership, aggregated across the seven Divisions, is a major contributory factor in declining income for WIA Federal. But the 'blame' for this fact of life – or is it criticism of supposed inaction? – is focused vaguely, on 'the WIA' as being a failure of the organisation. But, as Kevin Jones VK4AKI, in the September *OTY*, says: "It is us amateurs who are the WIA." Each of us, as members, are responsible for the 'membership factor'. Other factors are not directly within individual members' influence.

Consider this: if each Division member recruited one new member to their Division (or any Division!), over the next five years, there would be a net gain in aggregate membership of around 600 per year – even if the rate of non-renewals and SKs were maintained – resulting in an increase of more than 60% at the end of the five years.

The membership Recruitment and Retention campaigns, initiated and co-ordinated by WIA Federal over the past couple of years, have served to slow the rate of decline in aggregated Division membership. After these programs began, the annual loss fell from 362 in 1995 to 245 in 1996. That's something, but membership loss in each Division must remain a concern. A significant contributor to the percentage loss rate, and the actual numbers, comes from the smaller Divisions: ACT and Tasmania. The Divisions "more like clubs", as Peter Parker puts it. With loss rates between 10% and 20%, against loss rates under 5% in the larger Divisions, the argument that a club-based structure has inherent advantages fails in the face of the facts.

The apparent 'success' of clubs points to them meeting a need by providing services close to their 'customers'. The Queensland Division's action to 'get closer' to their members' has paid off dramatically. Part of this strategy has involved taking over the administration of their membership records. As I remember, the QLD Division's Federal Councillor once said 'we have members who live closer to Manila than to Melbourne'. In 1994, before they took this (at the time, controversial) action, their membership loss rate was just under 10% for the year. In 1995, it plummeted to 1.05% and remained under 2% for 1996.

What this says is that there is most definitely a role for the Divisions, still. But the way they organise that role may need to be examined. That's an issue for each Division to sort out, not WIA Federal, or myself. The Queensland Division has one of the greatest geographic spreads in its membership. The ACT and Tasmanian Divisions are much more close-knit

The 'model' of a more fragmented organisation comprising a collection of geographically distributed small clubs clearly has identifiable problems, and no doubt some hidden ones. The NZART has learned this, to their cost. They have posted operating losses each year for a number of years now. Likewise for the ARRL and the RSGB. The assumptions implicit in Peter Parker's argument and Chris Lowe's support of it, can thus be seen to have an inherent weakness. Change is proposed for the sake of change, rather than seeking solutions to known existing problems. Would we simply exchange one set of problems for another?

I'm not arguing in support of necessarily maintaining the present situation. WIA Federal should change in response to, or even in anticipation of, change in the world in which we operate.

Peter Williams' suggestion that WIA Federal save money "by not socialising around the region on expensive conventions", I believe, is short-sighted. There is, indeed, purpose in "costly visits to overseas societies and ITU conventions." Co-operation between the NZART and WIA Federal, initiated during so-called "costly" reciprocal visits, has led to improved licensing conditions and the clearance of interference from our bands, for example.

The ITU does not hold "conventions". That term equates to "junkets" in many people's minds. They hold conferences. Decisions made at these conferences can have significant impact on amateur radio - for better or worse. The fact that the WIA actually pays money to have a representative on the Australian delegations to World Radio Conferences, a delegate who contributes to the work of the Australian delegation alongside looking after the interests of amateur radio, counted in our favour with the Federal Government in 1995 when it came to negotiating a more reasonable licence fee than the proposed \$70+. The Ministerial Secretary didn't know that. It was a significant factor in changing the government's attitude.

The WIA doesn't pay to send a 'token' delegate to WRCs. THAT would be a waste of money. We send Dr David Wardlaw VK3ADW. His background, his continuous experience in Institute affairs, and in radiocommunications and standards administration, serves us well. So do his national and international contacts in amateur radio and in fields which impact amateur radio. His knowledge of the factors and forces shaping the future of amateur radio also serves us well. And David isn't the only person in this position. Has amateur radio gained tangible benefits? Most definitely. See "A Decade of Change", *WIA News*, pages 16-17 of *Amateur Radio*.

February 1996.

Then there are the Region 3 International Amateur Radio Union Conferences, every three years. This is the forum which discusses and plans not only regional initiatives, but the strategies to be adopted on issues to go before WRCs. Such issues affect the future of amateur radio, and these conferences legitimise policies on those issues so that the views expressed by the IARU and amateurs on delegations at WRCs have credible weight. We'd be remiss in our duty, and in derogation of the WIA Federal Constitution, if we didn't participate. Having adequate WIA presence at the Region 3 Conference in Beijing in September was considered of such importance that four Division members paid their own way, to swell our delegation's ranks.

Representation in international affairs is paid for by a \$2 component (often referred to as a levy, as a result of past history) which goes into a cumulative fund set aside for this specific purpose. While it is accounted for in the WIA Federal balance sheet, it is not part of the profit and loss accounts.

Peter Williams charges WIA Federal with spending only two lines on "policy and planning on (the) future direction of amateur radio" in the June issue of *Amateur Radio*. This is seen as one of WIA Federal's "sins of omission". This is being selective with the evidence. A reading of matters published in *WIA News* alone, over the six issues previous to June's, reveals 1000s of words on such matters. Then there was the canvassing, through a questionnaire, of members' views on proposed changes to the definition of amateur radio and the qualification of amateur operators in the International Radio Regulations. Doesn't this issue affect "our future at home"? There should be some balance, so far as is possible within both our paid and volunteer resources, between

pursuing actions on the domestic front and in the international sphere.

Many members view national and international representation as primary roles for WIA Federal. WIA Federal has managed to assemble the strongest team of representatives in these areas that the organisation has had for many years. The activities in which WIA Federal now engages, and which it is increasingly expected to engage - with responses to government and regulatory authorities' proposals coming at frequent intervals - and the tangible successes achieved, are a significant accomplishment.

Returning to WIA Federal's income and expenditure. While a number of measures have been instituted over recent years, these have necessarily been in reaction to past events. Successive Federal Councils, Federal Directors, and hardworking Federal Office staff have wrestled with these issues over recent years. The functions WIA Federal now performs, and is expected to perform - and this includes the role of the Federal Office - are somewhat different now than they were three or four years ago, let alone 30 years ago. Meeting the financial contingencies of these changes has proved a difficulty, as successive WIA Federal annual reports have admitted.

No case is made by any of the three correspondents for a different organisational model. That's a disappointment. Only assumptions or assertions are advanced that 'something' different must solve what is perceived as 'the problem', which is articulated only vaguely. Likewise, only assertions are made about the likely demise of WIA Federal. It 'ain't broke', but it is clearly recognised that it does need 'fixing'. It won't happen overnight, but it will happen.

Neil Penfold VK6NE
WIA Federal President

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI

Nightly at 2000 local on 3550 kHz

VK2RCW

Continuous on 3699 kHz and 144.950 MHz

5 wpm, 8 wpm, 12 wpm

VK3COD

Nightly (weekdays) at 1030 UTC on 28.340 MHz

and 147.425 MHz

VK3RCW

Continuous on 145.650 MHz, 5 wpm, 10 wpm

VK4WIT

Monday at 0930 UTC on 3535 kHz

VK4WCH

Wednesday at 1000 UTC on 3535 kHz

VK4AV

Thursday at 0930 UTC on 3535 kHz

VK4WIS

Sunday at 0930 UTC on 3535 kHz

VK5AWI

Nightly at 2030 local on 3550 kHz

VK5VP

Continuous on 145.650 MHz, 5 wpm to 12 wpm

VK6RCW

Continuous on 147.375 MHz, 3 wpm to 12 wpm

VK6WIA

Nightly (weekdays) at 2000 UTC on 3.555 MHz

QSLs from the WIA Collection

Ken Matchett VK3TL* Honorary Curator WIA QSL Collection

VK2WAH

Operating for just 24 hours on 22 September 1995, this station, activated by members of the Wahroonga Amateur Historical Radio Association, celebrated a very special event in Australia's history. This was the first direct wireless message to be sent from England to Australia. This message, sent from Carnarvon, Wales to Wahroonga, Sydney in September 1918, was transmitted by arrangement with Guglielmo Marconi and the director of his wireless telegraph station.

The front of the QSL shows the message from Joseph Cook, Minister for the Royal Navy, and received by Australia's Prime Minister, the Right Hon W M (Billy) Hughes. The Dragon Radio Club of Carnarvon, Wales, callsign GB2VK, celebrated the event in conjunction with the Wahroonga station VK2WAH in attempting to contact as many radio stations as possible world-wide on this special date.

G5YQ

This is a pre-war QSL from Scotland sporting the G5 prefix. The prefix G is one of the original "call letters" assigned by the International Telegraphic Union of Berne, Switzerland to Great Britain and published in the *Year Book of Wireless Telegraphy 1913*. However, in 1937 the G prefix gave way in Scotland to GM.

The above QSL, dated 28 October 1934, is one of the earlier Scottish QSLs. It was sent by Jack Wylie of Glasgow to Ron Cameron VK7RC of Wynyard, Tasmania during the Melbourne Centenary Contest. Jack's transmission from "The Land of Tartan and Lucky White Heather" was crystal-controlled (CCTX) on the 40 metre band and he was receiving on a two-stage audio receiver (O-V-2).

OM9SIAD

Slovakia was added to the DXCC listing on 1 January 1993 following the deletion of Czechoslovakia. The Constitution of the Slovak Republic was signed in 1992 and the independent state of the Slovak Republic established the next year.

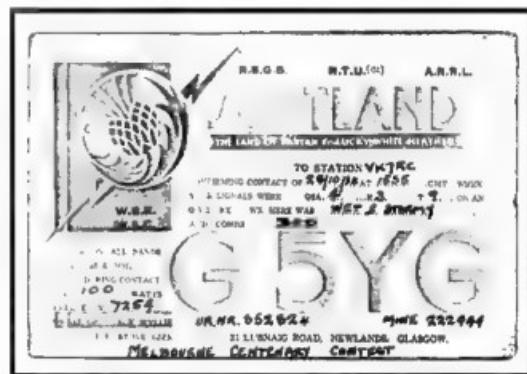
The OM9SIAD QSL was a special issue QSL celebrating the 50th anniversary of the ending of the Second World War. Pictured on the QSL is a MiG 29 fighter aircraft operated by the Slovak Air Force on the occasion of the 3rd Slovak International Air Display (SIAD) held in the capital city of Bratislava.

Thanks

The Federal Body of the WIA would like to express its thanks to the following for their kind donation of QSLs to the Collection. Bill VK2XT; Snow VK3MR; Arthur VK6ART; Ivor VK3XB; Roth VK3BG; Stan VK3TE; and Ian McLaren SWL, courtesy of Allan VK3AMD.

Also to the friends and relatives of the following "Silent Keys": Bruce Mann VK3BM, courtesy of Alf VK3LC; Perce Sebire VK3MX, courtesy of Stewart VK3ESD; and Fred Freeman VK3ALG, courtesy of Jack VK3SY.

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Tel (03) 9728 5350



Repeater Link

Will McGhie VK6UU*

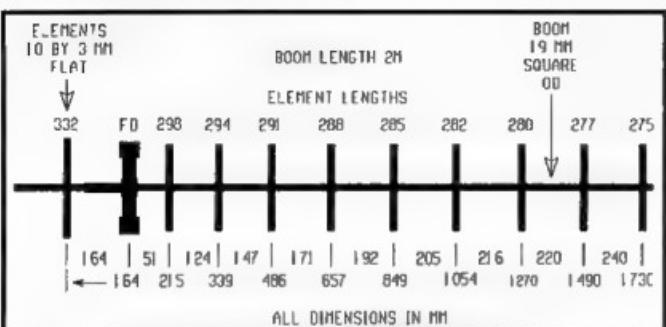


Fig 1 - Dimensions of the 11 element 435 MHz Yagi.
(Drawing by VK6UU)

Why?

I have been on seven weeks holidays and I found I have less spare time than when I'm at work. Why is this so? Perhaps you take on those large jobs that you can't do while working and, as a result, there is less time?

VHF-UHF Signal Generator

I mentioned a home brew VHF-UHF signal generator a couple of months back and promised to have it ready for publication soon. Well, soon was to be this month. The variable frequency generator was almost ready to put the finishing touches to for publication, when I ran into a problem or two. The generator had been running for several months and only needed to be accurately documented. In the process of doing this I made a minor circuit change to see what effect it would have. The end result was the oscillator did not oscillate, so I changed the modification back to the original. Would you believe, the oscillator still would not run!

Many hours were then spent trying to figure out why the oscillator would not oscillate. I did manage to solve the lack of oscillation but, in the process, discovered the circuit was unreliable. As well, I had difficulty in setting the oscillator on the correct frequency in order to achieve the required frequency tuning. The end result is that I ran out of time.

So, rather than rush the result, my intention is to present the generator next month. The signal generator is a little gem. It provides an FM signal from 140 MHz to 150 MHz and 420 MHz to 450 MHz.

UHF Yagi

More and more UHF links are being put

in the right word, as it is a tight fit and a bit of a struggle to make it all fit together. Rather than try and describe how to do this I will leave it up to you. It is not all that hard but does take a bit of push and pull.

The total length of the RG-213 coax used as the folded dipole works out at about 650 mm. I say about because it does depend on just how the coax fits inside the plastic pipe and the gap left between the ends. Leave about 10 mm between the ends where the balun connects. The balun is connected to the braid of the RG-213; the inner of the coax is not used. The RG-213 could be replaced with any conductor, thick electrical wire for example; it is just that RG-213 fits well, can be soldered to, and is available.

What determines the overall size of the folded dipole is the 260 mm length of 15 mm diameter plastic pipe that fits into the right angle fittings. The two right angle fittings at the top and bottom are joined together by a short length of 15 mm pipe so they butt together. I trust the drawing (Fig 2) is easy to follow.

The 15 mm pipe measures 20 mm from outside to outside. I gather plastic reticulation pipe is measured from the inside. Use the thinner PVC pipe as it comes in different thicknesses. (Pipe is specified by its ID, tube by OD Ed.)

The balun, made out of RG-58, fits inside the support and is soldered to the folded dipole. This can be difficult. What I settled on was drilling a large hole in the T piece opposite the coax feed and then, through this hole, soldering the balun and coax feed onto the folded dipole. Once this is done and tested, force Silastic™ into the hole to fill the T piece as best you can. Once dry, the dipole is finished and weather proof.

The folded dipole is not critical and should



A close-up of the folded dipole and feed. (Photo by VK6UU)
(Colour original inserted)

have a low SWR from 420 to 450 MHz. I found the large spacing between the two longest sides produced a wide frequency response. Fig 2 shows the folded dipole with the T piece in the same plane as the dipole. This is done for clarity but, as you can see from the photos, for mounting to the boom of the antenna, the T piece is turned 90 degrees to the folded dipole and the plastic pipe enclosing the feeder is attached to the boom with worm drive clamps (the type you use around your garden hose). (More trademarks. Also known as Jubilee Clips. Ed)

At the end of the plastic feed pipe attach a right angle piece to point down to prevent water entering. I used the blue PVC glue to hold the whole dipole assembly together. However, as you will discover, it is difficult to glue all the pieces together and you may be left with one that you can't. Nevertheless, what you end up with is a broad band dipole, with a low SWR, which is easy to attach to the boom of a Yagi and should keep the weather out for ever.

The Beam

The accompanying Yagi design (Fig 1) comes from Don Graham VK6HK. The design was run through a couple of computer programs and came up with 11.5 dB gain over a dipole. I also did a physical gain measurement using accurate stepped attenuators and, would you believe, the gain measured 11.5 dB! The design is centred on 435 MHz and for 420 MHz it may be advisable to scale the design a little.

Balun

Ever wondered how a coax balun works? How can it transform 50 ohms to 200 ohms or



The completed 11 element 435 MHz Yagi before mounting in the air.

(Colour original inserted)

(Photo by VK6UU)

75 ohms to 300 ohms? I have used these devices many times, but never really understood how they work. Well, I now know, but can I put it into words that are easily understood?

The balun is half a wavelength long at the design frequency. Think of this length of coax joined to our feed coax and then run straight out at 90 degrees. Do not bend it into the familiar U shape for the purpose of this explanation. We now have two points of interest, one where the feed coax joins the balun, and the other at the end of the balun coax. The voltage at the join between the feed coax and the balun, for example, at a given instance is one volt positive. At the other end of the balun coax, due to it being a half

wavelength long, it is one volt negative. This is important to understand: half a wavelength between points on a coax cable results in the voltage being of the opposite phase or voltage.

Now, as the voltage in our example is one volt positive at the join between the feed coax and one volt negative at the end of the coax balun, we have a difference between the ends of two volts. If we apply this to a load, such as an antenna, we have two volts instead of one volt; something for nothing? Do we have a voltage gain?

The answer is yes, but not a power gain. As the power must remain the same, but the voltage has doubled, what else has to change for this to be possible? The answer is the impedance. The impedance is now four times the impedance of the feed coax. If it was 50 ohm coax, we now have 200 ohms; and if it was 75 ohm coax, we have 300 ohms. Two volts across 200 ohms is the same power level as one volt across 50 ohms.

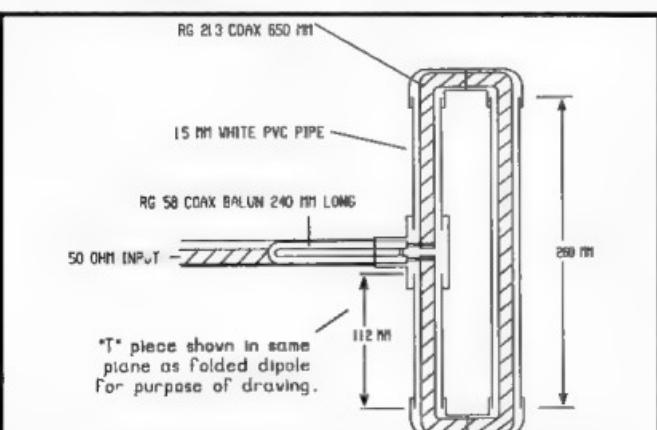
If you understood all this, then my writing skills are good enough; if not, then ask someone who knows how a half wave balun works and see if my explanation becomes clear.

Correction

In a previous article on 29 MHz gateways I mentioned that there are four gateway frequencies. Subsequently, I received a phone call from John Martin of FTAC, advising the correct number of channels as three not four. They are: 29.120 MHz, 29.140 MHz and 29.160 MHz. Sorry about the extra channel I mentioned of 29.180 MHz.

Now back to the signal generator!

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Schematic of the plastic pipe folded dipole for the 11 element 435 MHz Yagi. Note that the RG-213 coax is only used as a convenient dipole; any material could be used.

(Drawing by VK6UU)

Spotlight on SWLing

Robin L. Harwood VK7RH*

Well, another year has come to a close and it has been a very interesting one at that. Several international broadcasters drastically reduced their output, including our own Radio Australia where financial cutbacks saw the demise of several language sections, namely French, Cantonese and Thai, as well as reduced programming in all remaining sections. Also, the Darwin site was put into mothballs until it could be required again. As I am writing this, a potential user has come forward for this but it is uncertain whether it will eventuate. More on this further down. The Shepparton site remains the main location for Australia's external senders, with a very small facility near Townsville serving PNG and the western Pacific.

Some international broadcasters disappeared altogether, namely Monitor Radio International and WVHA. Ironically, the latter was part of Monitor Radio and was sold to a splinter Adventist group in Florida, which got into financial difficulties. I believe that the 500 kW sender has since been sold to World Harvest Radio but has not yet been reactivated.

Other broadcasters have come pretty close to leaving short-wave as well, including Radio Canada International, Radio Prague and Radio Budapest.

The VOA and Radio France International have axed programs to Europe and Latin America. The push is continuing to move on to satellite transponders despite the fact that few receivers are around, compared to the millions of short-wave receivers.

Of course, the output from many international and domestic stations can be downloaded off the Internet in Real Audio format, yet the numbers are restricted to about 60 connections at once. Continuing congestion over the Net means that these audio feeds can easily freeze up or drop out.

Program placement via satellite to sympathetic domestic public broadcasters, or as the result of commercial arrangements, has also not been successful. Many commercial stations, particularly in Latin America, were taking advantage of these and only inserting a tiny fraction of the output, often without giving the source of the material. This, naturally, has seen the international stations reassess this policy. Another reason why short-wave will continue is the realisation that satellites are strategically vulnerable to being attacked and disabled in the event of a war.

This year has seen several competing technologies being promoted for direct audio broadcasting. However, the major

manufacturers are wary of committing themselves to any one technology because the failure to reach common standards means that the market would be fractured.

The case of AM stereo is still fresh in mind; there were four completely different systems on the market in America. Because of this failure to agree on one universal system, AM stereo quickly became moribund as no major manufacturer marketed sets in commercial quantities. True, another reason why it didn't take off was the dominance of FM; the marketplace saw to that.

Experiments have been conducted with digital broadcasting over HF. Again, two completely differing systems have been tested, one by the VOA and NASA and the other by Deutsche Telekom at Jülich. The latter is promising, as it will include analogue audio next to digital. The American system would require a completely different transmitting and receiving method, although I do believe that an effort is being made to work out a compatible system. I think that the American model will probably interface with a home PC, as it will use a compression method such as MPEG, which is standard on most PCs.

Radio St Helena made its annual appearance on 26 October between 1900 and 2300 hrs. Transmitting over a disused PTP sender, rated at only 1500 watts, signals were patchy. Here, I was again unsuccessful in hearing it, although I believe that a listener in Victoria and another across the Tasman did briefly hear it. Propagation was poor to most areas; also a transmitter very near Washington DC fired up very close to the frequency of 11.092 MHz. This made it very difficult for US monitors to hear it, although some were able to hear it due to the 10 kW signal skipping over their location. Some Europeans were more fortunate despite very low levels.

I noted on the world news on SBS-TV that the Australian government was approached by the US to utilise the disused Darwin senders to broadcast to China and SE Asia over Radio Free Asia. This station is identical to RFE and Radio Liberty, which were heavily jammed throughout the Cold War. The station broadcasts in Mandarin, Korean, Vietnamese, Tibetan, Khmer and Burmese. The SBS report said that the Australian government did not want to jeopardise Australian trade with China and was likely to tactfully turn it down. As well, Radio Australia was naturally concerned that, if the proposal went ahead, its Chinese language programming would be jammed. RFA is

jammed and is not easily heard within the target area anyway. Apparently the VOA, which does also get jammed (yet not to the extent of RFA), has a larger audience.

RFA has at present senders in some CIS nations and uses senders of several US-based religious broadcasters in the Pacific and Alaska. Because of the sensitivity from the particular CIS nations, locations are not given on the official International Broadcasting Board/VOA schedule. Also, one religious station is unhappy that they are involved, namely KNLS. They also feel that their programming is compromised.

Tuning around the utility segments, I came across a broadcaster in USB on 6970 kHz. It is "Radio For Peace International" in Costa Rica. It formerly was on 7385 kHz but, as this has quickly been filled up by powerful senders, the station has chosen the lower channel. I heard it around 0905 UTC and it is easier to hear than on 7 MHz. Programming is similar to that over Radio 3CR in Melbourne on 855 kHz. In fact, I thought I was hearing a harmonic of 3CR at one time because their callsign was mentioned on several occasions. Turns out that programs produced at 3CR are broadcast over RFPL.

I wish to extend Season's Greetings to all; and don't forget that the annual yacht races will be on between Christmas and the New Year. Listen on 2 and 4 MHz.

*5 Helen Street, Newstead TAS 7250

ME

Update

A Cost Effective Current-mode 1:1 Balun

(published on page 16 of November 1997 issue of Amateur Radio)

A Cost Effective Current-mode 1:4 Balun

(published on page 17 of November 1997 issue of Amateur Radio)

Ralph Holland VK1BRH, the author of both the above articles, advises that the URL of his Web page (shown at the foot of each article) is incomplete. It should be: <http://www2.dynamite.com.au/vk1brh>

It might be a good idea to correct your copy of the November 1997 issue of *Amateur Radio* now.

"Club Corner" - Coral Coast Amateur Radio Group

(published on page 27/30 of November 1997 issue of Amateur Radio)

The correct callsign of Les Daniels, the author of this contribution is VK2AKX, not VK2AKZ as published.

Please correct your copy of the November 1997 issue of *Amateur Radio* now. **ar**

Pounding Brass

Stephen P Smith VK2SPS*

I've just recently been advised of a new telegraph society that has been formed in South Africa by Roger Gould King ZS6QL called "OSQ Wireless Telegraph Society", or QSQWTS for short. The aim of the society is to promote and retain CW. The society's motto is "Less is Morse" which symbolises that you don't need hundreds of watts to successfully conduct a QSO. If there are any ex-South Africans residing here in Australia who wish to get in touch with Roger, he can be contacted at PO Box 167540, Bracken Downs 1454, Republic of South Africa.

I would like to thank John VK2KV for sending me information on the new products recently released by Vibroplex. The Vibroplex Straight Key Deluxe is, by all standards, a normal hand key; however, this is the first time in nearly 100 years that Vibroplex has added a hand key to its large range of semi-autos and Iambic lines. The key comes in three models, being the Standard with a black base, the Deluxe which

has a highly polished chrome base and upper parts, and the Gold with a 24 K gold plated base with highly polished chrome upper parts.

The other new key is the Double Key combination. This consists of a straight key and Iambic paddle, or a Vibrokeyer mounted on the same base. These are two lovely keys to chose from. Both base and keys are highly polished chrome with a recommended retail price of \$US349.00 (not cheap when you convert our dollars to US!). Still, it would be nice to have one in the shack. Further enquires can be made direct to Vibroplex.

In the August 1997 issue of *Morsum Magnificat*, the official Morse magazine of Britain which covers all aspects of Morse telegraphy, past, present and future, there appeared an article which will concern collectors of telegraph instruments. Recently, a UK collector was charged import duty of 3.2% plus value added tax of 17.5% on a \$300.00 telegraph set he received from a collector in the USA. British Customs

advised the gentleman concerned that the item in question cannot be considered as a gift as he had received the set in exchange for another item. Customs considered that he had paid for the key indirectly and was therefore liable for duty.

From my own experience, items declared as gifts and under \$50.00 are free from such charges, but additional charges are payable if the value of the item is greater than \$50.00. Just be careful how you fill in your Customs Declaration Form or you can be up for a large sum of money.

If you are not already a subscriber to *Morsum Magnificat*, I highly recommend it to readers who are interested in telegraphic items, as it contains so many interesting articles and photographs.

Next month in this column, a look at Australian hand keys as used by past operators. In the following issues will appear CW Contests; Zero Beat, what does it all mean?; and Sitting for your Morse exam.

Until then, a very happy Christmas and a safe and happy New Year to all readers of this column.

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Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

T Plugs

In respect of your editorial in the November 1997 issue of *Amateur Radio*, I wish to point out a glaring error. In NSW, at least, there is a standard for those "T" connectors as used by all emergency services (and naturally WICEN NSW). **THE TOP OF THE TEE IS POSITIVE!** The mnemonic is that the vertical bar looks like an earth pin.

I could say that Australia is still a collection of autonomous states, but I won't.

David Horsfall VK2KFU
President WICEN (NSW) Inc
PO Box 257
Wahroonga NSW 2076

More on T plugs

I noted your editorial comment on the polarity of the so-called T plugs. There is, in fact, no official standard, and two "Clayton's" standards The WICEN standard referred to - negative to the top of the T - applies only in Victoria, and NSW uses the opposite. I do not know what is done in other states.

The polarity used in Victoria was

established by government and commercial users of radios. I am told that it was based on the idea that the top of the T resembled a minus sign, while the vertical arm of the T represented the vertical part of the plus sign. All of the surplus radios such as Vintems which made their way into amateur hands were fitted with plugs wired in this way, so this became the unofficial standard in Victoria for both WICEN and amateurs in general.

The practice in NSW was the opposite. They decided to use the vertical pin of the T as the negative pin, by analogy with the earth pin on 240V AC plugs. This is just as logical an idea as the practice in Victoria. In fact, it probably goes one better because it is also consistent with an international guideline

used by electrical authorities, that if the connector has a RADIAL PIN, ie parallel with a line from the centre to the circumference of the plug, it is the one which should be used for the earth.

It seems unlikely that there will ever be an agreed standard which is the same in all states. But, in the lack of a standard, there is one thing we could standardise on, always buy plugs with transparent tops. That makes it easier to see which way they are wired!

John Martin VK3KWA
Chairman FTAC
PO Box 2175
Caulfield Junction VIC 3161

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VHF/UHF – An Expanding World

Enc Jamieson VK5LP*

All times are UTC.

Change of Fax Number

Please note that my fax number has changed to 08 8575 1777 as of now. My e-mail address was missing from my last notes, but be assured it still exists as vkslp@ozemail.com.au and will continue to do so until otherwise noted. With this issue I commence my 29th year of writing these notes.

Two Metres to New Zealand

Gordon McDonald VK2ZAB sent me a fax to say that he had received an NZART VHF Century Club Award, Certificate 160, for VHF contacts with more than 100 New Zealand stations. All were made using SSB. Gordon believes he may be the first VK station to achieve this feat, with all contacts in excess of 2000 km. Congratulations Gordon. I suspect that world-wide there would not be many amateurs, if any, to have made hundreds of contacts on two metres at distances in excess of 2000 km.

However, it is ironical that the significance of this achievement appears to be lost on the NZART Awards Manager, who did not note in a letter or on the award that it was for two metres. The usual VHF Century Club Award is to collect 100 points by scoring one point for contacts on six metres, three points for two metres and five points for 70 cm. This claim was for 100 contacts on two metres, not 100 points. Hopefully, the necessary endorsement can be made in the near future.

Gordon has sent me a list of 108 first contacts, each to a different station and dating from 26/01/81 to 22/01/97. All the listed contacts were made between November and February inclusive. The list shows the first contact with each station, but during the period noted hundreds of two metre contacts were made with the ZLs, and in some cases three and four contacts with the same station each season over the entire period. The contacts were spread over 18 or 19 locator squares.

Gordon said it is now almost impossible to obtain a QSL card for any contacts, even those which break a record. In 1980 the QSL rate was around 30 per cent, now virtually zero.

Gordon has also made contacts with ZL on 70 cm and 23 cm. The VK2 record for 70 cm is for a contact between VK2ZAB and ZL1AKW in 1988. A new VK2 record for 23 cm was established in January 1997 between VK2ZAB and ZL1AVZ.

ZL News Update

30/9/97: "With the installation of a TV translator near Auckland, operating on New Zealand Channel 1 (44-51 MHz), amateurs in Auckland were notified by letter on 28 June 1997 that they were to cease operation on the 50.0-50.15 MHz band."

"Previously the NZART had received assurances from the local broadcaster that they wouldn't take up the use of Ch 1 in Auckland. ZLs have to get approval to use 6 m from the Ministry of Commerce Communications Division; it seems that some amateurs in the Auckland area may gain access to the 6 m band on a non-interference basis, following the submission of new permit applications and testing and approval by the authorities. They still have 51-53 MHz as secondary users." Information from G3FPK.

Antarctica

Roman EM1KA, will be QRV from the Ukrainian research base at Vernadsky for another year. There is the possibility of some 6 metre operation from there. He is regularly QRV on 1827 kHz at 0400, QSL via JA2JPA.

Six Metres is Not Dead

Don Graham VK6HK reports: "Some stirrings on 48-49 MHz here on Monday, 13 October, with video on 48249.8, 48250.3, 48251.0, 49751.03, 49749.96, 49749.7, 49750.24 and 49751.35 kHz. Bearing generally about 350 degrees. TV video carriers up to S7 but mostly S1-2, with each frequency exchanging prominence during the period. No signals on 50 MHz."

The following is an overview of six metre activity for late September and for October, practically all being by TEP mode:

- 27/9 1120 JA3EJE heard VK8VFb 50.056
- 27/9 1140 JAH6VXP to VKRPN 50.110 5x9
- 28/9 0840 JAH6WFY to VK4AFL 50.110 319
- 29/9 0658 JA1RJU to VK8RRH 50.110 5x9
- 29/9 0400 VK3OT heard JA72MA/b 599
- 29/9 0530 VK3OT heard 49749.8 warbly offset
- 29/9 0626 VT3AT to JA1RJU 50.110 5x9
- 29/9 0640 VK4AGPS Asian video 49.750 to S9
- 29/9 0730 VK3OT heard JA1GY/b 50.0097 539
- 29/9 1044 JAH4UPO heard VK8VF/b 589
- 29/9 1117 JAH4UPO to VK8AN 50.110 5x3
- 29/9 1230 JA6GQG to VK8RMS 50.110 5x5-9
- 29/9 1243 VR2IL to VK8RMS 50.110 5x1
- 30/9 2055 LU9E04 worked four KP4 stations 5x9
- 30/9 2100 WP4O heard by LU1LDMA on 144 MHz
- 1/10 1115 JAH4UPO heard VK8VF 50.056 599
- 1/10 1810 G4ICD heard by 7Q7RM
- 2/10 1246 VR2IL to VK8RHS 50.110 5x9

- 2/10 1300 VR2IL to VK8AN 50.120 5x5
- 3/10 2235 CO2KK to HH7PV 50.130 5x9
- 3/10 2258 AC4TO to CX1LU, HH 50.110 5x9
- 4/10 2300 WP4O to LU, CX, PY 5x9
- 4/10 0615 VK4AD0 and VK4TL 50.120 heard by JA3EJE
- 5/10 0435 VK4APL to JR2NET 50.140 5x5
- 5/10 0436 JE8BHE to VK4AFL 50.140
- 5/10 0440 JA1RJU to VK4AFL 50.140
- 5/10 0442 JA1RJU to VK4DDE 50.120
- 5/10 0451 JA1RJU to VK4LE 50.139
- 5/10 0530 UAO-TV 49.750 to VK3OT
- 5/10 0750 N7ET/DU7 to JR1LZK 50.085 559
- 6/10 2350 WP4O to PY5CC 50.110 5x6
- 8/10 0445 VK3OT UAO-TV 49.750 multi video
- 8/10 0610 VK3OT heard JA7ZMVA/b 50.027
- 8/10 0625 VK3OT 49.752 +/- video
- 8/10 0701 VT3AT to JA6YBR 50.110
- 8/10 1800 ISMMX heard by K3RRE and K1DT 50.105
- 8/10 2210 W4PO to LU and CX 5x9
- 9/10 2310 W4PO to LU 5x9 and PY5CC 5x1 50.110
- 11/10 2237 PY5CC to EHRBPX 50.110 5x5
- 11/10 2345 PY2DSC to TI5KD 50.110 5x5
- 12/10 0132 VT3AT to KHE1/OI 50.110
- 12/10 0415 VT3AT heard JA2IGY/b, JA6YBR/b
- 13/10: WP4O worked many LU and CX3ET
- 13/10: G4ICD to EH9V/SIS/SPY/PYU 50.9x Es
- 13/10: 1230 G4ICD copied 5B4CY multi-hop Es
- 13/10: 1656 Italy worked A22BW TEP
- 13/10: PP5JD-1 ic TI4HQ, HP3XUG, V44KA, 8P6ER, GPKIA, KP4JN,
- 13/10: 2256-2350 PY to KP4, J3, WP4, PR7 2340 PY5CC worked 8P6 on 144 MHz
- 14/10: 0012-0107 PY to T4, T15, ZP5, EH8
- 14/10: 0102 PY5CC worked JR6HJ 50.110 5x9*
- 14/10: 0330-0410 VT3AT worked many JA's
- 14/10: 0339 VT3AT 50.110 heard by JA1RJU 599
- 14/10: 0345 VT3AT 50.110 heard by JHMHE
- 14/10: 0420 VT3AT heard first VK video 46.17165
- 15/10: 1600 TR8CA to G4ICD, GU/C/T/F 5x9
- 15/10: LU2EGQ copied XE and YV beacons
- 16/10: 2055 PY2NQ, PY5CC to WP4O 50.110 5x9
- 17/10: 2150 PP1BG to CT3FT, EH8BPX, 5x9
- 18/10: PY5CC worked CT1AL, CT1HB, EH1YY, first PY to Europe
- 18/10: 1530 VK51KC, 1725 TR8 into Europe
- 18/10: 1600 VS1VHF to heard by SM7AED
- 18/10: 2300 G4ICD to PY5CC
- 19/10: 0604 VK2QF 50.110 worked JH6VXP 559
- 19/10: 2218 PY5CC to HE7, CT4, 232 KP4, V44, 8P9HA 2344 PY5CC to 8P6HA, 8P6ER on 144 5x1
- 20/10: 0038 PP1CZ to 8P9HA, YY-4DY, PI1XUG 5x5
- 20/10: 0300 to 0700 VK5LP heard UA/B/Y TV 49.750 +/-
- 20/10: 0620 VK3OT heard VK8RAS/b, Russian TV 5x9
- 20/10: 0629 VK3OT heard JA7ZMVA/b
- 20/10: 0620 VK3OT heard UAB TV 49.750 +/- strong
- 20/10: 0635 VK3OT worked VK8GJF 50.15
- 20/10: 1700 TR8CA to G4ICD 5x9 also ON/PA/F
- 20/10: 2120 WP4O to LU and CX9DX
- 21/10: 0020 WP4O to CX, LU 5x9
- 21/10: 0511 VT3AT VK video again on 46.17165
- 21/10: 0519 VT3AT to JA1ZYK 50.110
- 22/10: 1520 IK0 to V51KC
- 22/10: 2150 PP1CZ and PP1BG to D44BC 50.110

23/10: 0419 VK4AFL to JA1RJU 50.140 5x9
23/10: 0620 JA6DMU to VK4D0 50.110 5x9
23/10: 0644 JA1RJU to VK4WNT 50.110 5x9
23/10: 0647 JA3EGE to VK4DO 50.120, VK4 video S9
23/10: 0810 JA3EGE to VK4BRG 50.110 5x4
23/10: 0824 VK4BRG to JA3EGE
23/10: 0830 JA3EGE to HL1LTC 50.110 5x9
23/10: 1008 HL1LTC to JA1RJU 50.110
24/10: 0221 HL1LTC to JA1RJU 50.110
24/10: 0426 VK4BRG to JA1RJU 50.110
24/10: 9G1BU (Greece) worked by many stations 5x9
26/10: 0009 ZP6CW to T15KD, TY4DYJ, TI4JHQ, HP2XUG
26/10: 0428 JA3EGE reported VK video on 46.170
27/10: 1000-1400 GIGI to IYU/EACT/S5 by Es
27/10: 2149 EHTWK heard ZD8VHF/b
28/10: 0005 PY5CC to K3LLL 50.100 5x9
28/10: 0039 LL8EW/D to W5 and W6 50.130 5x7
29/10: 0254 JA1RJU to VK4APC 50.180 5x9
29/10: 0257 JL4GTO to VK4ZX 50.120 5x9
29/10: 0259 JL4GTO to VK4APC 50.110
29/10: 0255 JA1RJU to VK4AFL 50.150 5x9
29/10: 0300 VK3OT UAU/BY-TV 49.750 +/- TV offsets
29/10: 0305 JA1RJU to VK4DO 50.125 5x9
29/10: 0314 JL4GTO to VK4BRG 50.135 5x9
29/10: 0315 JA1RJU to VK4BRG 50.110 5x5
29/10: 0352 JL4GTO to VK4AFL 50.150 5x9
29/10: 2246 EATWK heard ZD8VHF/b 539
30/10: 2237 PY2PA to TI4JHQ
30/10: 2314 PY5CC KH6HI/b 579 **, 2317 KP4UK 5x9

30/10: 2337 PY5DP KH6HI/b 579 **
30/10: 2353 PY5CC to NH6YK 50.110

*JA to PY JM1SZY received an e-mail from Peter PY5CC which said: "Yes, I worked Kenji JR6HI (Okinawa) at 0101 on 14/10 on 50.110. Signals 5x9. It was a nice surprise. No other JA or Pacific stations. Many stations from Central America and Caribbean areas."

** These are interesting reports of KH6HI/b, as it seems too early for Southern Hemisphere Es. No other reports of such east-west propagation.

Thanks to Six News, OH2BUA Web Cluster and VK3OT for the above table of more than 100 events. I have given rather full coverage to these openings this month to indicate that six metres is far from dead, particularly in the Northern Hemisphere, where there have been TEP openings almost on a daily basis. It seems few JA stations are presently operating on six metres and not many VKs either.

Here at VK5LP I noted video carriers around 49.750 MHz on at least 20 days during October. The one most received was on 49.7493 at a bearing of 335 degrees which is the direction of China and eastern Russia, strength usually around S2 but reaching S8 on 13/10. Generally there by 0400, but heard

as early as 0300 and continuing until about 0600/0700.

Such signals are being noted in VK2, 3, 4, 6 and 8. This is similar to the 1987/88 period when most of us did not realise the significance of the reception of such signals which led to F2 openings to Europe and the UK, also to the US, in 1989, and continuing for four years.

I would suggest that six metres should be given particular attention during the next equinox (March/April) and most certainly next September/October when it seems the possibility exists of bridging the distance to Europe in the evenings and to the US, Central America and the Caribbean in the mornings. By 1999 the openings to EU/UK will probably spread out over a longer period than the equinox, with November being important.

News from China

Alan VK3XPD sent the following, called "BY1QH Special", which was contributed by Lars Melin SM0KAK, a member of the Tsinghua University Amateur Radio Club, Beijing, China.

BY1QH, the club station, is presently looking for stations who want to try 144 MHz DX, and are located less than 2,000 km from



Radio and Communications

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Crumbs, yet another new Yaesu VHF/UHF mobile transceiver! This time it's the FT-8100R — and it's easily the best dual-band mobile the company has produced thus far. What makes it different and better? Read our review to find out. We also investigate the most successful ever domestic marriage between computer and radio, this time from Icom.

December's R&C is jam-packed with great features for amateur radio operators. Here are just a few of them...

- REVIEW: MFJ-259 SWR Analyser and antenna resistance checker. A great aid to fixing crooked antennas!
- OPINION PIECES: Two of them, from widely-different backgrounds. Where is amateur radio heading?
- SPECTRUM ANARCHY!! Our precious amateur bands are awash with pirates. Let's help stamp 'em out.
- MACQUARIE ISLAND: Tom Slokes, VK0TS, spent a year operating from a true wilderness. He reports...
- THEY DID IT WITH MIRRORS. A fascinating historical account of detecting enemy aircraft. Don't miss it!
- As usual, we have our three DX columns, mods and more... the best stories and regulars every month!

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(PS. We also have the biggest collection of radio-oriented Classified adverts in the country. There's lots of them because they work so well. Ask your newsagent to keep a copy for you each month, or ring 1800 25 2515 for subscription details. Hurry — you might miss something!)

Beijing in such DXCCs as BY, BV, VS, HL, JT, UA, and, in particular, VK6 (less than 400 km from Dampier). The Dampier area is the only location to which it would be possible to make QSOs on 144 MHz using Trans-Equatorial Propagation. Stations interested in working with BY1QH on 144 MHz need at least one Yagi (preferably horizontally or circularly polarised), the capability to work on SSB or CW, a good take-off (low horizon) in the direction of Beijing, and a minimum output power of 50 watts.

In the first leg of the ARRL EME Contest on the weekend of 18-19/10, BY1QH worked SM5FRH, SM5BSZ and SM2CEW. The QSO with SM5FRH was the first EME QSO ever from China. BY1QH also heard and identified 11 more stations during the contest. On the weekend of 25-26/10, BY1QH worked KB8RQ (first BY to North America on EME), and W5UN. Also heard was VE7BQH.

BY1QH will participate in the second leg of the ARRL EME Contest on 15-16/11. Antenna improvement is becoming urgent as it is not yet wind-proof. In addition, the club is requesting China Radio Sports Association (CRSA) to clear the much QRMed 144.000 MHz, caused by a local paging system.

Tsinghua University Amateur Radio Club is seeking any possible assistance from the international amateur radio community, such as on EME. Write to David Zhang BZ1BM at bz1bm@vq.chnmail.com or Lars Melin SM0KAK lars.melin@era.ericsson.se.

Something New

This is surely a rarity. Alan Devlin VK3XPD saw the following on the Internet and thought it may interest readers of *Amateur Radio*, adding: "Some of our US cousins have a lot to learn, and the spelling is appalling too. One learns something new every day - I can't wait to try it!"

The message: Subject: Modifying FM revievers .. Date: Thu, 16 Oct 1997 11:46:56 -0500 From: "Dr. Cosmo-SYS" drkosmo@server.iso.net Organization: Information Superhighway Onramp Newsgroups rec.radio.amateur space

"I heard one can do this by clipping the device to the antenna and i think the negative (-) side of the battery. I want to make it receive different Freq's and maybe transmit on them too. I know about the FCC and licensing stuff so i will keep the power down :)

"I'm new in radio stuff so please use simple terms and maybe scematics (i can read those. >)

"thank you in advance Dr. Cosmo-SYS"

I leave you to draw your own conclusions.
Thanks Alan

Beacons

Ian Glanville VK3AQU advises: "Further to my last e-mail regarding the closure of VK3RAI/b. [Reported in September issue] The beacon was shutdown on the 16/9 after more than 10 years of continuous service."

"I have received an e-mail from Michael VK3TDV on behalf of Ralph VK3WRE, Eastern Zone repeater officer, accepting the offer to take over the beacon and incorporate it into their plans to establish 2 metre, 70 cm and 23 cm beacons. I am very pleased that someone is taking up the offer and will put it to good use."

Rod VK4KZR reports that the VK4RTT beacon is off air. The understanding is that the Brisbane VHF Group will reinstate it soon. More later.

Ron VK3AFW reports: "The Melbourne VK3RTG beacon on 144.430 returned to air at 0425 on 13/10. It runs seven watts to a halo in an average location at Clayton. All reports appreciated. It went off due to a high voltage transient which destroyed the power supply, although the remainder of the hardware survived."

Meteor Scatter

Ron Cook VK3AFW sent the following report from Scott VK4ISR: "On 16/10 I spent a half hour in the shack listening to 50 MHz before departing for work. The following is a summary of what I monitored."

"2031 VK7RAE/b 50.057 419.5*

The following are for VK3SIX/b on 50.053 MHz.

2042 549.30*

2043 519.5

2045 419.20

2046.15 319.5

2046.45 419.10

2059 419.5

2100 519 - 559 30+

2102 419.5

2103 319.15

2105 319.5

2106 519.5

*The final column is the ping/burn duration to the nearest 5 seconds.

"The pings were not significantly stronger than normal, as I monitor the beacons each Saturday and Sunday mornings while listening on 144.2 and 432.2 MHz, but the number of pings had increased. At all times the VK3SIX beacon was detectable, sometimes just 3 dB above my imagination!"

"For your information, I was using my IC-551D with 20 dB receive pre-amp, and Timewave DSP into my temporary six element Yagi, six metres AGL."

Hamfest Launch

Alan VK3XPD reported: "Saturday 18/10 at 1300 Announcer/Packet/Slow

Scan TV - all on 145.700 MHz sequentially. Repeater 432.975 input, 145.375 output.

"Unfortunately - "the powers that be" have limited the payload to just 1 kg therefore transmit power is a low 100 milliwatts for the Announcer and 1 W when transmitting packet. That's all I have."

Alan also reports that the Sputnik 1/3 scale, PS-2, will be RS-17 when released, according to the sponsor's web page. Listen on 145.821 FM (145.80-145.85 for Doppler?). Date of release has again been pushed back to 3 November, during the next EVA (space walk) from MIR.

Tropo Report

Ron VK3AFW advises that on 6/10 good conditions allowed Rod VK2TWR to work Andrew VK7XB at 1205 on two metres at 5x5. The beacon VK7RAE was 529.

Also on 6/10, at 2100, Andrew VK7XR worked Ron VK3AFW 5x9 both ways on 144.08 MHz SSB, and 5x1 both ways on 432.1 MHz SSB at 2116. Andrew was able to access many two metre repeaters along the southern part of VK3. Unfortunately, there were no other stations around to take part in these excellent conditions.

Repeater Update

Steve VK2KFJ provides the latest information regarding six metre repeaters in VK2:

VK2RMB Sydney (Northern Beaches), 53.675 working, local activity has increased, waiting for summer DX. VK2RSN Newcastle, 53.625 working. VK2RWI Sydney (north-west), 53.850 - nearing completion, could be on air in December. VK2RTM Walcha, 53.575 - should have been on air by middle of '97, status not confirmed yet. Licence and equipment taken over by Walcha Radio Club.

Afternoon TEP and Es Linked Up

Steve VK3OT reports: "Following the 46.240 TV report by JA1VOX of VK2QF working JH6VXP yesterday (19 October) I carefully watched the band today."

"At 0600, like clockwork, the various 49 MHz TV stations from Russia and China appeared and built up over the next 30 minutes. The difference today was that the path was skewed North West and on investigating a QSB carrier on 50.047 I heard the VK8RAS beacon keying from PG66 Alice Springs over a short Es path of 1750 km. Also noted were strong 49 TV offsets, one running raspy video with what looked like a digital test pattern on the ICR7000."

"I QSOed Jeff VK8GF on 50.115 at 0640 on SSB, both running about 80 watts and 5x5 signals."

"The new JA7ZMA beacon came in after

the VK8 beacon faded out, which is the normal extension mode as the hole into PG66 closes, and the path extends via TE afternoon mode. The beacon has three callsign sequences then FUKUSHIMA then QM07 (the grid) and a Dit Dah (I am unsure of the significance of this). Frequency is 50.027 MHz dead and best report was at 0625 519 to 539 with fast QSB.

"The TV shifted to 300 degrees and I heard Vladivostok in grid square PN briefly on 49.7499 with pronounced signature and the JA21GY beacon 50.010 audible using DSP only at 509. I alerted VK5LP who was also copying multiple TV offsets around 49 MHz and the VK8RAS beacon."

Portable Operation

Barry VK3TBM operated portable from Mt Tassie on 13/9. On two metres only (20W into 5 el Yagi) he worked at 2233 VK2TWR 5x5; 2237 VK3BWT 5x3; 2242 VK3DEM 5x9; 2245 VK1BG 5x1; 2247 VK2ZAB 5x1; 2249 VK2BBF 5x2; 2252 VK1BG 5x3; 2254 VK1DO 5x2.

He returned to Mt Tassie on 27/9, but this time with 2 m and 70 cm. He had two new antennas, a recently completed 10 el DL6WU Yagi for two metres, and a 15 el DL6WU for 70 cm. This was the first opportunity to test the antennas and both worked well.

The "on air" start at 2255 meant he had missed many possible contacts but stayed on site till 2345, and managed to work (on 2 m) VK3HY 5x9, VK3DEM 5x9, VK3WRE (Ralph, Traralgon) 5x9, and VK3ZQV (Michael, Blackwarry) 5x9.

On the weekend of 11/12 October, with a camp-out in the State Forest south of Vaughn Springs in central Victoria, he had more time, so he took two 10 el DL6WUs for 2 m for a trial run together.

"I was on air at 0230 on 12/10, and listened and called till 2330 (admittedly stopping to sleep during the night). However, our favourite campsite is not well elevated; in fact, the surrounding ridges seemed to provide excellent protection from all forms of harmful RF. I heard not a crackle. I got

occasional short noises from the Mt Anakie beacon, and that was as good as it got.

"However, on the drive out I found I could easily receive the Mt Anakie beacon on the halo from a nearby ridge. While mobile, on the way home, I was fortunate to work Des VK3CY from Mt Franklin (5x9); and Alan VK3XPD while passing Gisborne. Thus, I was able to prove to my companions that my radio did, in fact, work and was more than a mere white noise generator with a fancy dial."

On 18/10, Barry went portable near the summit of Mt Hoogly, 10 km west of Mt Tassie. Using a single 10 el DL6WU on two metres, he worked: 2245 Norm VK3DUT Lakes Entrance 5x9; 2249 VK1BG 5x3; 2254 VK2ZAB 5x1; 2300 VK1DO 5x2; 2305 VK3AUU 5x9; 2325 VK3KLO 5x7; 2332 Len VK3BMV Numurkah 4-5x1; 2336 VK3DUQ/p Dromana 5x9; 2345 David VK3KDR Hallam 5x9; and 2348 Les VK3ZLS Point Lonsdale 5x5. The site wasn't ideal as his low mast was unable to clear the low eucalyptus re-growth to the north and north-east, and a pine plantation 200 m to the west affected signals to Melbourne and beyond, especially since they were wet from the drizzle that morning.

Closure

October was certainly an interesting month. The many days of video signals around 49.750 +/- from about 335 degrees is worth noting and augers well for more TEP during March/April 1998. Our cousins in the Northern Hemisphere have certainly been given a treat with so many openings across the equator. If you want to live in a prime TEP location, then try Brazil or Puerto Rico.

Closing with two thoughts for the month:

1. A person can be so well-rounded that he isn't pointed in any direction; and
2. If mankind profits from mistakes, what a wonderful future is coming up!

73 from The Voice by the Lake

**PO Box 169, Menindee SA 5264*

Fax: 08 8575 1777

Packet: VK5LP@VK5WI#ADL#SA.AUS.OC

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WE'LL KEEP YOU POSTED

Those in the know say that '98 promises to be a vintage year for ham fests and special events. They are growing in popularity year after year and even more will be scheduled in 1998. Keep track of all the dates you need to mark down in your diary via our column'

COMPLIMENTS OF THE SEASON

Sincere good wishes for the coming festive season. Everyone at Icom appreciates the loyalty you give us, and we look forward to bringing you lots of innovative new products next year. Enjoy the holidays and stay safe.

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BOOK REVIEW

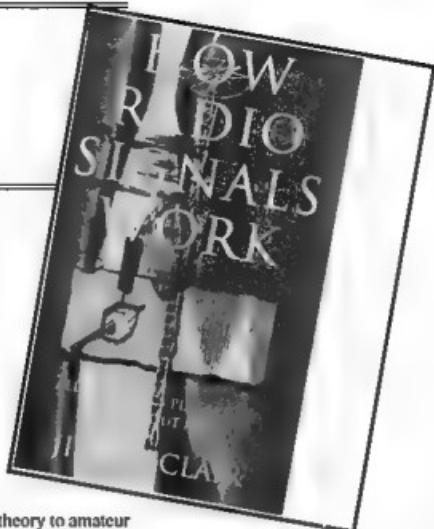
How Radio Signals Work

Publisher: McGraw Hill Australia

Author: Jim Sinclair

Reviewed by: Bill Rice VK3ABP

ISBN 0 07 470329 3



Amaateur Radio received this book for review from McGraw Hill several months ago, and I apologise to the author and the publishers for having taken so long to look at it. I chose to review this book myself, rather than hand it over to another who may have read it sooner, because I had, on a number of occasions, met the author and I was interested to see "what he was on about"! Some decades ago he was VK5ZSJ, and later VK8ZSJ. I was a little disappointed to find that he seems to have no current licence. His former calls have belonged to others for some years.

The book begins at a very elementary level because it is intended to be intelligible to readers who have no prior knowledge of radio or propagation at all.

Having created a basic framework by use of simple analogies, it then builds on this structure, achieving eventually a coherent survey of essential theory with an absolute minimum of mathematics. It would be an ideal beginner's text for

students aiming at radio theory to amateur licence standard. It also has an excellent 18 page glossary of technical terms, the definitions therein being both precise and concise.

There is considerable material on propagation, but perhaps more regarding near-ground transmission paths on VHF and UHF than ionospheric propagation at HF. In this the book reflects the author's

professional experience with Telstra and its predecessors, installing TV and radio-telephone systems over outback Australia.

In conclusion, it is an excellent elementary textbook and should be available to all students beginning to learn about radio.

The recommended retail price is \$39.95.

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of October 1997:	
L10172	MR E D ALCOTT
L21063	MR G H ARELL
L30965	MR S B KELLY
L30966	MR M J RUDLING
L60390	MR W J HARDMAN
L60391	MR D MCLOUGHLIN
OE3WHC	PROF W HARRANTH
VK1AY	MR Y SATO
VK2AKW	MS J M KEY
VK2DA	MR M J HARDY
VK2FDX	MR C HALL
VK2FLB	MR E MILES
VK2HVS	MR B P VANDERSANDE
VK2Kvh	MR V HEE
VK2TMV	MR D J BROZICEVIC
VK2VIM	MR I G MACGREGOR

VK3MRG	MR M GEORGE
VK3OC	MR J COWAN
VK3WE	MR F PAVIC
VK3XGL	MR G J LEEDER
VK3ZG	MR G CAMPBELL
VKSZKS	MR S LIDDEN
VK6VU	MR W N NEWHAM
VK7MGW	MR R W MCCULLOCH

Beijing Hams Crack First Two Metro Moonbounce QSOs

After many months of work, set back by equipment thefts and breakdowns, BY1QH, the club station of the Tsinghua University in Beijing, finally confirmed three, 144 MHz Earth-Moon-Earth QSOs over the night of 18-19 October with SM5FRH, SM5BSZ and SM2ECW, in Sweden. They subsequently worked KB8RQ and

WSUN, the following weekend. The contact with SM5FRH was the first EME QSO from the People's Republic of China.

BY1QH runs 200 watts output to a bay of four, nine-element Yagis. Club president David Zhang BZ1BM said the University club received a lot of technical help from Lars Melin SM0KAK, who is presently working in Beijing. The station has to battle pagers in Beijing which operate close to the 144 MHz band edge.

They are also looking to try 2 m trans-equatorial propagation (TEP) into the north-west coast of Western Australia and schedules are being established with at least one operator there.

[Released 3/11/97, updated 11/11/97]

WICEN NEWS

David Horsfall VK2KFU*

Here is the second of what is hoped to be a regular column about WICEN activities; as promised, unless I receive input from other Divisions then all you're going to read about is NSW news, and I can keep that up indefinitely..

"T" Connectors

I would like to take this opportunity to clarify a point made in the editorial in November *Amateur Radio* magazine, referring to the polarity of "T" connectors. Whilst it is true that Victoria chose a particular approach, the simple fact is that there is no national standard for this connector (which is why I personally will not use them). The various emergency authorities in NSW (and presumably ACT) decided to go a particular way, and so WICEN (NSW) had no choice but to follow them, resulting in the horizontal pin being **POSITIVE**; the mnemonic is that the vertical pin looks like an earth pin. The best thing to do, especially for cross-border operations, would be to assume nothing, and to carry a multimeter and a polarity-changer.

WICEN Events

The post-AGM "silly season" in NSW, where there was an exercise just about every weekend, has come to a close, so this would be a good time to describe some of the more unusual events in which WICEN (NSW) participates; what do other States do?

The weekend of the full moon towards the end of October (like Easter, it's a true "movable feast", leading to occasional conflicts with JOTA also held around that time) sees the annual **Hawkesbury Classic Paddle**, in which canoes of all shapes and sizes are paddled down the Hawkesbury River under the light of the moon; the paddlers themselves are otherwise thought to be quite sane. Naturally, their safety is paramount, and to this end WICEN deploys an extensive voice and data network, for safety communications and "due soon" messages.

Of interest is that, due to the terrain, traditional communications over the length of the course is not possible, so heavy use is made of linked repeaters (both fixed and portable). The idea is that a failure anywhere in the system will not affect the entire event, and communications into adjacent checkpoints would still be possible via simplex. To gain an idea of the importance of safety, just about every year we have a hypothermia case or two (this time it required

a helicopter evacuation), and in one year there was a drowning (thankfully not a canoeist). The participants also have to watch out for ferry cables suddenly rising out of the water (they're hard to see at night); and sadly, some idiots seem to think it's funny to throw rocks at the canoes..

Another interesting event is the annual **Bungonia Caves Rescue**, in which during a weekend various squads such as the SES, Police Rescue, VRA, etc are trained in the finer points of extracting people from caves, under the auspices of the NSW Cave Rescue Squad (who incidentally were prominent at the Thredbo disaster, and the Newcastle Earthquake).

Due to the potentially hazardous nature of these exercises (hardly a year goes by without an "authentic") again the safety of the participants is paramount, and WICEN provides a message facility, both voice and data, from the caves back to camp. This is an important exercise, as it stresses formal message-passing under realistic conditions. Notwithstanding the gravity of the event, there is still plenty of scope for experimentation, and use was made of the DVR system (Disaster Victim Registration,

used at Thredbo under WICEN supervision!) in the Sydney Police Centre, and also underground radio communications using the single-wire earth-return "Michiephone" telephone as a feedline to the surface.

Are You Ready?

Speaking of the festive season, this is supposed to be a quiet time for WICEN (in NSW, at least), but major disasters - earthquakes, floods, fires, storms; all the elementals in fact - seem to happen around now, so please keep your batteries charged and your equipment in full working order, ready for that sudden activation. How are the gas bottles for your camping stove? Do you have "long life" food and water ready to hand? What about that dodgy microphone connector you've been meaning to fix for ages? Are you ready?

News for WICEN Column

Please send contributions for this column to dave@geac.com.au (is there anyone on the planet who "doesn't" have access to e-mail?), or alternatively via packet radio to **VK2KFU@VK2KFU**, or snail-mail to PO Box 257, Wahroonga, NSW 2076.

If further information about WICEN (NSW) is required, please contact the acting State Co-ordinator, Alan Whitmore **VK2YYJ**, on 015-097-217.

*PO Box 257, Wahroonga NSW 2076
Internet e-mail dave@geac.com.au
Packet: **VK2KFU@VK2KFU.NSW.AUS.OC**

BR

WIA News

ACA Upgrades Amateur Information on its Web Site

Information for amateur operators and prospective amateurs published by the Australian Communications Authority, was updated at the end of October and published on their Internet Web site at www.aca.gov.au.

The four publications are:

- the "Amateur Licence Information Paper", covering licence grades, qualifications, examination exemptions, special call sign allocations and fees etc;
- "Amateur Examinations", covering the grades of Amateur Certificate of Proficiency, examination arrangements, theory and regulations qualifications, Morse qualifications, and syllabuses for the AOCP (full call), AOLCP (Limited), NAOCP (Novice) and NLAOCP (Novice Limited) qualifications, etc;
- "Amateur Operating Procedures", covering emission modes, interference, call sign suffixes, call-and-reply procedures, emergency procedures, the Q-code, and more; and
- "Amateurs Visiting Australia", for the information of overseas-licensed amateurs wanting to operate while visiting Australia.

For those who don't have Internet access, copies of these papers can be obtained from the nearest ACA Area Office.

[Released 3/1/97]

Adelaide-Accra

242

Brisbane-Auckland

123

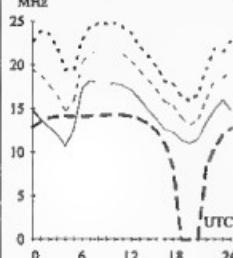
First F 0-5

Short 14682 km

First IF7-11

Short 2289 km

MHz

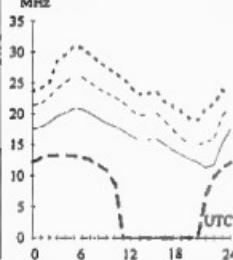
**Adelaide-Singapore**

311

First 2F4-9

Short 5414 km

MHz

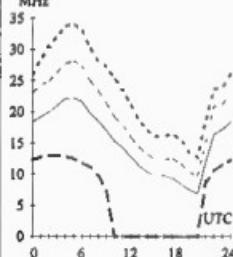
**Adelaide-Tokyo**

1

First F 0-5

Short 7855 km

MHz

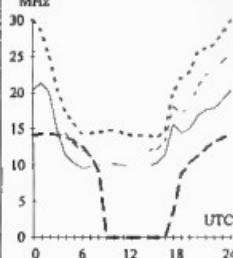
**Adelaide-Vancouver**

49

First F 0-5

Short 13421 km

MHz

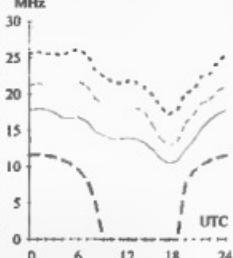
**Brisbane-Manila**

320

Second 3F9-17

Short 5813 km

MHz

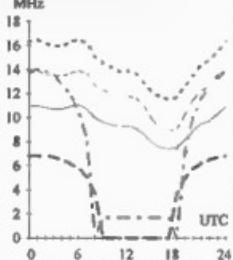
**Brisbane-Honolulu**

49

Second 3F5-10

Short 7569 km

MHz

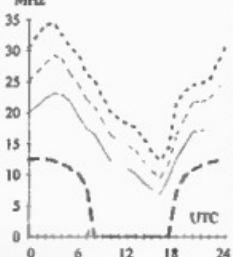
**Brisbane-Wellington**

114

Second 2F20-28

Short 2325 km

MHz

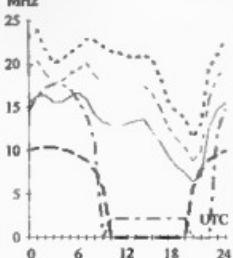
**Brisbane-Auckland**

123

First IF7-11

Short 2289 km

MHz



HF Predictions

Evan Jarman VK3ANI

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. This also indicates a possibility of communication (percentage).

The frequencies, identified in the legend, are -

Upper Decile (F-layer, 10%)

F-layer Maximum Usable Frequency (50%)

E-layer Maximum Usable Frequency

Optimum Working Frequency (F-layer, 90%)

Absorption Limiting Frequency

The predictions were made with the Ionospheric Prediction Service program, ASAPS V3.2. The T index used is shown above the legend. The Australian terminal azimuth, path and propagation mode are also given for each circuit

AR

T Index: 41

UD

F-MUF

E-MUF

OWF

ALF

Frequency scale

Time scale

Canberra-Pretoria

231

Second 4F4-10

Short 10824 km

MHz

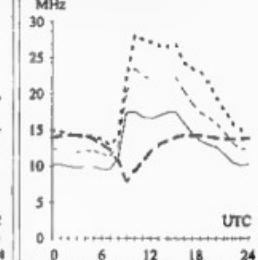
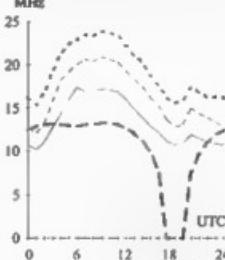
Darwin-London

145

First F 0-5

Long 26170 km

MHz

**Canberra-Washington**

70

First F 0-5

Short 15939 km

MHz

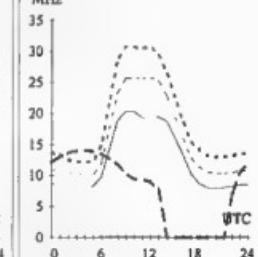
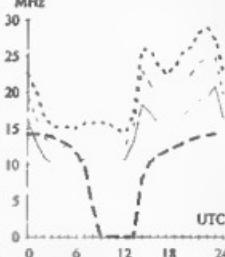
Darwin-London

325

First F 0-5

Short 13854 km

MHz

**Canberra-Vancouver**

49

First F 0-5

Short 13421 km

MHz

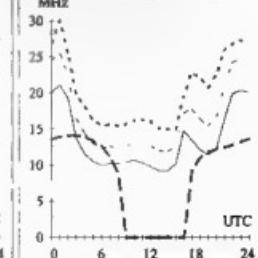
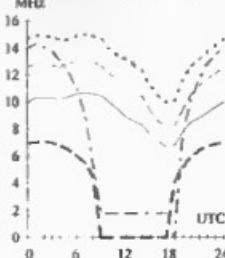
Darwin-Los Angeles

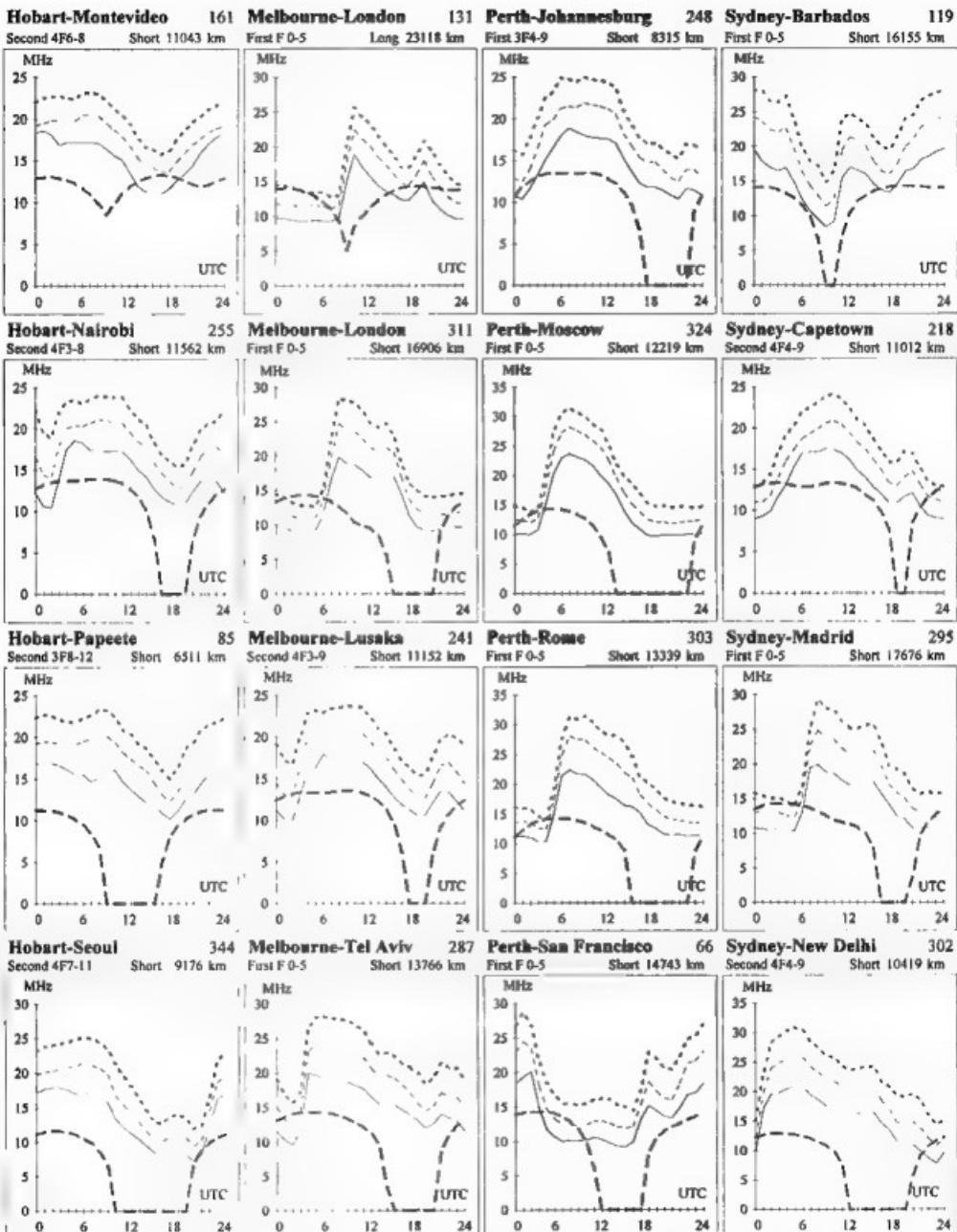
58

First F 0-5

Short 12693 km

MHz





HAMADS

- Hamads may be submitted on the form on the reverse side of the *Amateur Radio* address flysheet. Please use your latest flysheet where possible.
- Please submit separate forms for For Sale and Wanted items, and be sure to include your name, address and telephone number (including STD code) if you do not use the form on the back of the *Amateur Radio* address flysheet.
- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment offered for sale should be included in the Hamad.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
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- Fax: (03) 9584 8928
- E-mail: vk3br@c031.aone.net.au

TRADE ADS

AMIDON FERROMAGNETIC CORES. For all RF applications. Send business size SASE for dutypay & S&H. PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Buonano Ave Kiama) Agencies at Webb Electronics, Albury Assoc TV Service, Hobart Truscott Electronic World, Melbourne and Mildura. Alpha Tango Products, Perth. Haven Electronics, Nowra and WIA Equipment Supplies, Adelaide.

WEATHER FAX programs for IBM XT/ATs *** "RADFAXZ" \$5.00 is a high resolution short-wave weather fax. Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which) Needs SSB HF radio and RADFAX Decoder *** "SATFAX" \$45.00. is a NOAA, Meteor and JMS weather satellite picture receiving program. Needs EGA VGA & WEATHER FAX PC card, + 137 MHz Receiver *** "MAXSAT" \$75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5" or 3.5" disks (state which) plus documentation, add \$3.00 postage ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4003 Ph 07 248 2785

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2 kW Antenna Tuner Kit includes roller inductor, 2 HV variable capacitors and turns counter. ONLY

\$US229 plus S/H. Contact Kilo-Tec, PO Box 10, Oak View, California 93022, USA.

FOR SALE ACT

Yaesu FT-101ZD, instruction manual, \$500 ONO. Hustler vertical antenna inc 30 m resonator, \$900. Yaesu YD14B microphone H Bromley VK1KGJ, QTHR

FOR SALE SWR

HF antenna and tower: 60 ft (18 m) three-stage wind-up tower. 3 sets of guys, turnbuckles, TH6DXK antenna. Dawa rotator, dismantled Sydney. \$900. G Popham VK2EZQ, QTHR, 09 460 437, 1900-2100 EADT

Kenwood TS-430S, FM, Y88A, access, s/n 1052300, \$900. Yaesu FTV-707 transverter, 2 m/6 m/70 cm modules, s/n J102356, \$400. Yaesu FC-107 antenna coupler, \$200. Yaesu FC-107 antenna coupler, \$250. FTW/FC-107 mobile bracket, \$10. KDK FNI-2016A 2 m FM tx/rv, mobile bracket, s/n 5582, \$375. All in good condn with hooks. Geoff VK2BGP, QTHR, 02 6743 6519

Kenwood TS-940S, approx 15 - 20 hours use, like new; brand new SM-220 monitor and BS-8 bändoscope, new in boxes, never connected, matching SP-940 filtered speaker, MC-60 desk inc, all boxes and circuits, \$3250. Icom IC-575H, 6/10 m, 100 W, as new, \$1750. Kenwood TS-790A in-hand satellite tx/rv, all mode, six contacts only, as brand new, \$2600. Kenwood TS-811B 70 cm, all mode, in excellent condn, \$1100. Two Syntex 2 m mobiles, both with all NSW repeaters, 28 W, scan etc, very clean, \$250 each. Dawa 2 m amplifier, pre-amp, 5 W in for 90 W out, built-in fan, brand new in box, never used, mobile mount, \$450. Kenwood TS-700SP, all mode, 2 m, digital readout, built-in PSU. \$650. Aron WS-635 35 MHz double beam CRO, as new, \$350. TECH audio generator, \$80. TECH signal generator, \$80. Dynascan USA Model E-200, BK precision solid-state signal generator, 100 kHz - 216 MHz in seven bands, all metered etc, top

quality generator, \$250. All items include handbook, most with workshop manuals, original boxes. All being sold due to ill health. A Walsh VK2TBW, QTHR, 048 612 092, fax 048 611 536.

Icom IC-2GAT hand held, BP-70 battery, LC-40 carry case, wall charger, manual and circuits, boxed, mint condn, \$400 ONO. Yaesu FT-901DM ext VFO, excellent condn, leads, manual, original box, \$300 ONO. Kenwood AT-230 ATU, manual, original box, very good condn, \$250. MFJ-1700B Tx antenna switch, boxed, excellent condn, \$95. Icom LC-40 hand-held carry case, \$10. KIBV DX Award Directory, over 2240 different amateur awards, \$25. Motorola heavy duty leather hand-held case, \$25. Stephen VK2SPS, QTHR, 02 999 2933 (AH).

SCS Factor, Amfor, RTTY TNC in mint condn, c/w Plutomer and MT terminal software programs, \$275 negotiable. Mac VK2DT, QTHR, 02 9868 1131, fax 02 9868 4540.

Deceased estate VK2HH 3 el beam, 20-15-10 m, KR400 rotator and remote controller, connecting cables, mounted on telescopic tower of pipe design, fitted with hand wrench and tilting base, purchaser to dismantle, located in Cronulla, \$550 ONO. Enquiries to George VK2UN, 02 4384 2783.

Yaesu FL-2100B linear amp, manual, VGC, \$1000 ONO. Yaesu YP-150 watt meter/dummy load, VGC, \$150. Yaesu CPU2500 2 in tx/rv, handbook, inc, VGC, \$350. Yaesu FT-747 HF tx/rv, manual, VGC, \$800. Yaesu FT-901 scanning VFO, manual, \$200. Yaesu 20RRH 2 m tx/rv, PA3 car adapter/charger, MH12 Spkr/Mic, unused, \$350. Peter VK2DBI, QTHR, 02 6367 5095.

Collectors' Collins 5114 Rx, \$400. Hallicrafters SX101A RX, \$250. 2 x AR7 Rx, spare coils, \$150 each. Eddystone 770/RJ 19-165 MHz, \$200. FRG7 Rx, \$200. Star SR200, \$80. Lafayette HA200, \$100. Trilex 9R59D, \$80. Bendix 211, \$70. Marine 60-2-10 MHz AM tx/rv, \$50. 5 x CB AM/SBB, \$50 each. Quad hub, \$40. Receivers with documentation, Carl VK2TP, QTHR, 02 6845 1999 (BH), 02 6845 7530 (AH) fax 02 6845 1435.

Drake TR7-209R 2 m tx/rv, case, VGC, s/n 180658, battery replaced recently, \$250 ONO. Peter VK2BPO, QTHR, 02 6743 6510 (AH).

Yaesu FR101 general coverage receiver with 6 and 2 m converters, handbook, \$450. Tono 9000, handbook, \$100. 8:1 balun, 2 kW, in-built lightning arrestors, weather-proof enclosure, \$40. HTX100 10 m SSB (tx/rv, \$150. Ray VK2FW, 063 541 410).

Yaesu FT-107M with DMS, s/n 01050139, \$150. YM-38 desk mic, \$60. Yaesu SP-107 speaker, \$70. Kenwood SP-180 speaker, \$65. DMP-200 printer, dual interface, ideal for RTTY, \$100 ONO. All in absolute mint condn, original cartons, manuals, not used last nine years. W Tam-Grange VK2KS, 02 4616 1141.

Drake TR7A HF tx/rv, s/n 11680, hand held mic, PST PSU (s/n 10497). TR7A general coverage rx/rv (s/n 3370), matching extra spkr (slightly damaged), workshop and operating manuals, cables to interface both radios, all in good working order, \$1600 ONO. Pat VK2BAE, 02 6768 1470 (BH).

Kenwood TS-505 HF tx/rv, AT-50 ATU, as new, \$1750. Kenwood TM-2700A 2 m mobile, \$150. Uniden HR-2150 10 m mobile, \$300. Uniden Soundowner UHF CB tx/rv, \$225. Yaesu FT-262 2 m FM hand-held, \$240. Yaesu FL-2100B HF linear

amp, non-WARC, \$350. R E Taylor VK2AOE, QTHR, 02 9449 6364.

• Yaesu FT-7 HF tx/rv, Ten Tec ATU, SWR bridge, Morse key, PSU. David VK2BDT, QTHR, 02 4821 5036.

FOR SALE VIC

• Yaesu FT-7 HF tx/rv, 5 bands, 25 W, 13.8 V supply required, manual, excellent condn, \$400. Heathkit linear amplifier, 2 x 572B tubes, full PSU has 4 voltage positions. manual. Yaesu mobile whips, 80, 40, 20 and 2 m with base, cable and connector, all in plastic tube with ends, \$250 the lot. George VK3DS, QTHR, 03 5332 3226.

• Yaesu PL-2100Z HF (incl WARC bands) Australian legal limit linear amplifier, in excellent condition, uses 2 x 572B tubes, s/n 11070425, price without tubes \$450, price with tubes installed and tested \$700. Chris VK3KCP, 03 9629 2653.

• Kenwood TS-520S with external VFO, \$550. R Trebilcot VK3NTR, QTHR, 03 9798 3248.

• Yaesu FT-757GX HF tx/rv, \$750. Bert VK3DVY, 03 216 804.

• Icom IC-Delta 100, 2/70/23 FM tri-bander, remote front panel, 50/35/10 W, wide RX, 642 memos, remote control mic, VGC with org packaging and accessories, \$1550. Bird model 4381 RF Power Analyser. Thrustline, uses standard Bird 43 elements, operates to 2.3 GHz, min/max hold, calculates SWR, mod %, return loss, FWD and REF power in PEP or dBm (this is not a toy!), \$750. Adam VK3ALM, 03 9794 7873, e-mail v3dalm@csj1.ams.net.au

• Racial RA17-L communications receiver, manual, spare tubes, \$450. Will deliver to Melbourne. Peter VK3IZ, QTHR, 03 5156 2053, jupiter@bigpond.com

FOR SALE QLD

• Deceased estate VK4-OD. Kenwood TS-830S with 200W ATU, MC-50 desk mic, \$600. Kenwood TR-2600 2 m HT, mobile stand, MS-1 charger, four battery packs, \$150. Mini Multi Tri-band beam, \$300. Crank-up mast, 25 ft, \$75. Ron VK4GZ, QTHR, 07 5448 4063.

• Icom IC-275H all mode 100 W tx/rv, new condn, ideal terrestrial satellite, \$1500. Goldstar CRO, 50 MHz dual channel, new condn, \$750. Peter VK4PO, QTHR, 07 3390 1129.

• Complete station: Kenwood TS-530S, V-1121/004, Datong ASPCO-30RR & 2147/A; Versa Tuner MEJ946-II; Mizuko SX2 pre-select; Archer high power low pass filter; Clipal 10 A power line filter; Entron EP-2000 SWR meter; antenna rotator; Kenwood MC50 mic; Morse hand key; Kambrook 4-way power outlet; EB31 tri-band dipole 20-15-10 m; MC35S noise cancelling mic; all in good working order, \$850. H Cox VK4XO, 07 5497 5308.

• Hills tower, 70 ft, three section, winch up, \$900. Amateur radio equipment table, 6' 8" x 2' 8" with shelves, power points, \$120. 40 ft Oregon pine pole with base, \$110. Three band El Yagi with motor and controller, \$300. Peter VK4EB, QTHR, 07 5546 6164.

FOR SALE SA

• Log periodic antenna, 8 el, MUST SELL, \$450 negotiable. Bits and pieces. Paul VK5MAP, QTHR, phone/fax 08 8651 2398 for list.

FOR SALE WA

• New corner antenna HB-35 tri-band beam, also tilt-over tower, buyer to collect, price negotiable. Tom VK6TP, 08 9299 6741.

FOR SALE TAS

• Kenwood TS-820 HF tx/rv, good condn, general coverage receive, desk mic, ext speaker, service manual, \$450. Brian VK7HSB, 03 6224 4844.

• Icom IC-736 HF & 6 m tx/rv, general coverage Rx. AC PSU, auto ATU, as new, boxes, manuals, \$2350.

• Icom PL-102 AM filter, s/n IC-760-761-.765-.757 and .775, new, \$65. Com Pakratt, s/n C64- & C128.

RS232 level conv, program cartridge, s/n AEA

PK232 MBX, new, \$120. Allen VK7AN, 03 6327 1171, 0417 354410.

WANTED ACT

• VLF receivers, Fluke 270 or other; thermionic noise diodes and tunnel diodes (any type). Paul VK1ZAS, 3 Redgrave Place, ACT 2611, phone/fax 02 6288 5577, e-mail paul@ise.canberra.edu.au

WANTED NSW

• Two valve sockets for QOE06/40 or QQVO6/40 or 6894. Bob VK2AVQ, QTHR, 02 9878 2359.

• RF probe type 2R56075 and HV probe type 3R56020 for AWA Voltomhystr. Maurice VK2OW, 02 9838 1834.

• BT-8 or PB-13 battery cases (either or both) for TH-28A. Noel VK2TNB, QTHR, 02 9546 3617

• Kenwood TS-600, details to Neville VK2QF, QTHR, 02 6373 8624, fax 02 6373 8611.

• Icom IC-725 handbook and/or operating instructions. A Ambery VK2BOG, QTHR.

WANTED VIC

• Power supply/modulator type MP-28B for TA-12 transmitter. Rack for SCR522 Tx/Rx, condn not important but must have all the gubbins. Borrow manual for Racial 9008M modulation meter. Peter VK3IZ, QTHR, 03 5156 2053, jupiter@bigpond.com

• Q meter or RF RLC bridge. All offers considered. Morris VK3DOC, 03 9824 8988.

MISCELLANEOUS

• The WIA QSL Collection (now Federal) requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, tel 03 9728 5350.

• Radio & Hobbies - Electronics Australia magazines, over 40 years, most complete since 1958, some 1940's wartime copies. Free to take but no sorting please! Take all or nothing! Keith VK2AXN, QTHR, 02 9489 0304.

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:

N Burton L20992
C O Healey VK2COH
A K Burt VK2XF
C W Johnson VK2YJ
I F (Ian) Berwick VK3ALZ

Tom Douglass Dowling VK40D

Tom Dowling passed away in hospital at Buderim, Queensland, on 28 August 1997, at the age of 77. He was born at Corio Village in Geelong on 17 March 1920 and was educated at Geelong College. After leaving school he worked at Dalgetys. In 1940 Tom enlisted in the Army and was sent to Singapore. When Singapore fell, he spent three and a half years as a POW and worked on the notorious Burma railway.

On his return to Australia, Tom married

Nancy. They lived at Lismore, Victoria, where Tom was branch manager for Dalgetys until 1952. Then followed 22 years on his property "Glenesk" near Swan Hill. In 1973 Tom sold the property and moved to Buderim.

Tom loved sport but amateur radio was also a consuming interest. He was a staunch member of the Sunshine Coast Amateur Radio Club and a keen CW operator; he held the Ken Wilford Memorial Trophy from its inception in 1994. He taught his eldest granddaughter Emma Forbes a little about the Morse Code and, in a final tribute at his funeral service, Emma spoke for us all in saying, "73 OM dah de dah".

Tom is survived by his wife Nancy, and daughters Jen, Angela and Diane.

Ron Marschke VK4GZ

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 CANBERRA ACT 2601
VK2	PO Box 73 TERALBA NSW 2284
VK3	40G Victory Blvd ASHBURTON VIC 3147
VK4	GPO Box 638 BRISBANE QLD 4001
VK5	PO Box 10092 Gouger St ADELAIDE SA 5000
VK6	GPO Box F319 PERTH WA 6001
VK7	GPO Box 371D HOBART TAS 7001
VK8	C/o H G Andersson VK8HA
VK9/VK0	Box 619 HUMPTY DOO NT 0836 C/o Neil Penfold VK6NE 2 Moss Court KINGSLY WA 6026

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division Address	Officers	Weekly News Broadcasts	1997 Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President Hugh Blenning Secretary John Woolner Treasurer Les Davey	VK1YYZ VK1ET VK1LD	\$72.00 \$58.00 \$44.00
VK2 NSW Division 108 Wigram St Paramatta NSW (PO Box 1066 Paramatta 2124) Phone 02 9589 2417 Freecall 1800 817 644 Fax 02 9633 1525	President Geoff McGroarty-Clark Secretary Eric Fossey Treasurer Eric Van De Weyer (Office hours Mon-Fri 11.00-14.00)	VK2EO VK2EFY VK2KUR	\$69.00 \$56.00 \$41.00
VK3 Victorian Division 40G Victoria Boulevard Ashton VIC 3147 Phone 03 9885 9261 Fax 03 9885 9296	President Jim Linton Secretary Barry Wilton Treasurer Rob Halley (Office hours Tue & Thur 0830-1530) Web: http://www.ttsa.com.au/~wavia/	VK3PC VK3XV VK3NC	\$75.00 \$61.00 \$47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone 07 5496 4714	President Rodger Bingham Secretary Peter Harding Treasurer John Presutto e-mail address: wiaq@brisbane.dialix.com.au Web: http://www.wiaq.powerup.com.au	VK4HD VK4JPH VK4WX	\$74.00 \$60.00 \$46.00
VK5 South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone 08 8352 3428 Fax 08 8264 0463	President Ian Hunt Secretary Graham Wiseman Treasurer Joe Burford Web: http://www.vk5wia.ampr.org/	VK5QX VK5EU VK5UJ	\$75.00 \$61.00 \$47.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone 09 351 8873	President Wally Howse Secretary Christine Bastin Treasurer Bruce Hedland-Thomas Web: http://www.faroc.com.au/~vk6wia	VK6KZ VK6GLZ	\$62.00 \$50.00 \$34.00
VK7 Tasmanian Division PO Box 271 Riverside TAS 7250 Phone 03 6327 2096 Fax 03 6327 1738	President Ron Churcher Secretary Barry Hill Treasurer Mike Jenner	VK7RN VK7BE VK7FB	\$74.00 \$60.00 \$46.00
VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (I) Student (S) Non receipt of AR (X)	Three-year membership available to (F) (G) (X) grades at fee x 3 times

Note: All times are local. All frequencies MHz.

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FT-920 HF/6m Transceiver With DSP

Now there's no excuse for not taking advantage of the latest advances in Digital Signal Processing, transceiver design plus the fun of 6m operation. The stunning new Yaesu FT-920 is a high performance HF/6m multi-mode receiver that provides 100W PEP output on the 160-6m bands, incredible front-end performance based on the FT-1000MP design, and a huge array of features that make it a pleasure to use.

At first glance Yaesu's renowned Omni-Glow LCD screen is obvious, and its wide-angle view provides a wealth of information about the transceiver's operating status with multi-function metering, dual frequency displays and an Enhanced Tuning scale for DSP bandwidth, CW tuning, FM discriminator and more. Inside, the FT-920 is built around a rugged diecast unibody chassis which provides excellent heatsinking for the low distortion dual MRF255 160-6m FET power amplifier.

For more comfortable operating when weaker signals are present Yaesu's engineers dedicated themselves to enhancement of real-world signal to noise ratios, and after thousands of hours of design and testing have produced an industry-leading 33.3MIPS (millions of instructions per second) processing speed DSP in the FT-920 that provides a two-parameter noise reduction system with 32 steps of front panel adjustment. This amazing system also provides dual control DSP passband tuning, DSP auto-notch filter, an amazing new transmit Digital Speech Processor, DSP mic

equalisation, fast acting DSP VOX circuitry as well as a Contest-ready Digital Voice Recorder!

Other features include an all-band (160-6m) auto antenna tuner which also provides greater receiver band-pass protection, Direct Digital Synthesis for clean local oscillators, selectable frequency-optimised receiver front-end pre-amps, and a Shuttle Jog tuning ring for fast QSY. A Dual Watch receive system allows you to check for band openings, especially handy when monitoring 6m. Also provided are SSB/CW/FM operation (AM with optional filter), 127 memories with alphanumeric labelling, IFSIshift and IF noise blanker to fight interference, plus an extensive menu system for selecting most "set and forget" functions. The FT-920 is supplied with an MH-31B8 hand mic, DC power lead and comprehensive instruction manual.

Why not call for a copy of the Yaesu 6 page FT-920 colour brochure to learn more about this efficient transceiver that's without peer in its price class.

D 3420



\$2995

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